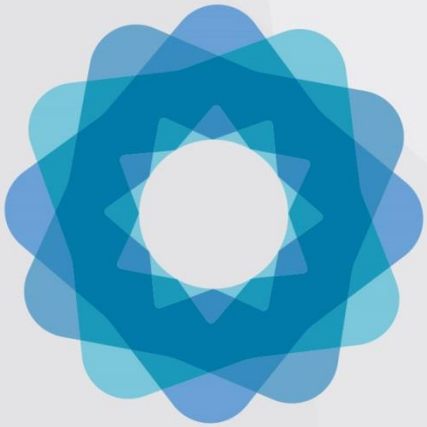

System of Environmental Economic Accounting

United Nations

System of Environmental Economic Accounting

National Plan for Advancing Environmental-Economic Accounting

(NP-AEEA)

-- Mauritius --

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Contents

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- Statistics Mauritius
- Maurice Île Durable Commission (MIDC)
- The Strategic Policy Unit (SPU) of the Prime Minister's Office
- Ministry of Finance and Economic Development (MoFED)
- Ministry of Environment, Sustainable Development and Disaster and Beach Management (MoESD)
- Ministry of Agro-Industry and Food Security (Including FAREI and Forestry Service)
- Ministry of Housing and Lands
- Ministry of Ocean Economy, Marine Resources, Shipping and Outer Islands (Including Albion Fisheries Research Centre and MOI)
- Ministry of Foreign Affairs, Regional Integration and Foreign Trade
- Ministry of Energy and Public Utilities (Including CEB, CWA, WRU and WWA)
- Ministry of Social Integration and Economic Empowerment
- Indian Ocean Commission (IOC)
- (since Mr. Gnany is the Ex-chairperson of Statistics Board and did not represent the Mauritius Commercial Bank)
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1 EXECUTIVE SUMMARY

The purpose of this document is to link current Mauritius environmental-economic accounting initiatives and policy requirements with United Nations (UN) System of Environmental-Economic Accounting (SEEA) and other international statistical frameworks. It provides the foundations for initiating statistical development towards improving decisions related to sustainable development and green economy. It is based on the ***Mauritius - Country Assessment Report***, *which* has identified the policy priorities, stakeholders and capacity for Mauritius to engage in such development. It has done so by reviewing the most recent documents in collaboration with Statistics Mauritius, and other key stakeholders. It positions the work within internationally accepted best practices for statistical development.

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 the priorities and opportunities in Mauritius for further improvement of the National Statistical System (NSS) 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.

The lack of coherence among environmental measurement initiatives imposes challenges in answering fundamental questions about natural resources including ecosystems and their contribution to human well-being in Mauritius. The degree of dependence of Mauritius' population on ecosystems for water, food, materials and employment is not well known.

What is the contribution of ecosystems and their services to the economy? How can natural resources and ecosystems be best managed to ensure continued services such as energy, food supply, water supply, flood control and carbon storage? What are the trade-offs between resource exploitation and land allocation with long-term sustainability and equity?

There is increasing international interest in establishing integrated statistical systems for this purpose. The SEEA has been established as an international statistical standard and is recommended as the measurement framework for a variety of related international policy activities. SEEA Experimental Ecosystem Accounting (SEEA-EEA) expands the scope of the SEEA Central Framework (SEEA-CF) to link ecosystems to economic and other human activities.

This document is intended to focus the efforts of the National Statistical Office (NSO), NSS and other stakeholders, including international agencies, to develop a cost-effective, ongoing and effective statistical systems and related institutional mechanisms to inform Mauritius' sustainable development policy objectives.

Mauritius has a unique opportunity to focus national and international efforts on addressing its sustainable development, climate change, biodiversity and green economy goals. The policy context for SEEA implementation in Mauritius is broad. It ranges from the general direction setting in the Blueprint for Vision 2030 to sectoral policies in relevant line ministries. There

are many relevant programs and projects concerning topics such as green and ocean economy, sustainable consumption and production, climate change, land use and sustainable development indicators. These all have links to information that may be sourced from SEEA based accounts.

> *"These 4 key focus areas [of the Blueprint for Vision 2030] are:*
> *1. Addressing unemployment,*
> *2. Alleviating, if not eradicating, poverty,*
> *3. Opening up our economy and new air access policies, and*
> *4. Sustainable development and innovation*
> *...*
> *To remain focussed on achievements, we will establish targets, benchmarked against international standards such as Living Standards, Income Equality, Doing Business, Happiness, Service Delivery, Good Governance, Environment Sustainability and Security and Safety."* (speech of the Right Honourable Sir Anerood Jugnauth GCSK, KCMG, QC, Prime Minister of the Republic of Mauritius at the launch of the High Powered Committee on Achieving the Second Economic Miracle and Vision 2030[1])

Mauritius has been promoting sustainable development as a way to address its unique vulnerabilities and opportunities as a Small Island Developing State (SIDS). The Blueprint for Vision 2030 and the Green Economy Action Plan[2] are amongst its efforts for operationalizing across the dimensions of sustainable development. One of the major opportunities for action to make possible the transition of Mauritius to a green and ocean economy is to build resilience and increase the adaptive capacity of the country. These are consistent with international policy drivers such as the Sustainable Development Goals (SDGs) and Aichi Target 2.

Monitoring these priorities can be addressed by developing SEEA accounts and thematic indicators. To support this, the National Plan for Advancing Environmental-Economic Accounting (NP-AEEA) proposes to develop a cost-effective, ongoing and effective statistical system and related institutional mechanisms. The key actions recommended by the NP-AEEA for Mauritius are (a) developing a comprehensive environmental-economic accounting information system; (b) assessing and integrating existing spatial data required to support expanded SEEA-CF accounts and to pilot ecosystem accounts; (c) conducting training and capacity building in environmental-economic accounting including ecosystem accounting; (d) enhancing coordination with national initiatives as well as international and donor agencies; and (e) immediately beginning work on priority accounts including Ecosystem Extent and Condition Accounts, Water Accounts, and Ecosystem Services Supply and Use Accounts, especially with respect to food security and water security, and putting the piloted SEEA-CF accounts (energy, water and materials) into ongoing production. To accomplish this will require establishing a high-level Steering Committee, Technical Committee and Working Groups with an appropriate governance structure, engaging stakeholders, implementing quality standards, establishing inter-departmental data sharing and developing new sources of funding.

It is proposed that rather than implementing a complex statistical system at the outset, this be done in stages. This document presents the first stage – a specific set of activities related to the implementation of the UN SEEA. High-level activities and impacts are listed below:

[1] https://www.cimglobalbusiness.com/news-official-launch-of-the-mauritius-vision-2030-.html.
[2] The Green Economy Action Plan is being reviewed by UNDP and has not yet been finalized or approved by the Government of Mauritius.

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

2 INTRODUCTION

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. This message was emphasized at the Rio+20 conference and culminated in the Post-2015 Development Agenda. The international community has further recognized that integrated statistics are essential to making informed decisions:

> *"We recognize the need for broader measures of progress to complement GDP in order to better inform policy decisions, and in this regard, we request the UN Statistical Commission in consultation with relevant UN System entities and other relevant organizations to launch a programme of work in this area building on existing initiatives." (Paragraph 38, The Future We Want: Outcome document adopted at Rio+20*[3]*)*

This project is part of the international community's commitment to develop these broader measures of progress and to integrate them into national statistical systems and decision making.

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 to 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.

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.

Both the SEEA-CF and SEEA-EEA use the accounting concepts, structures, rules and principles of the System of National Accounts. The SEEA-CF starts from the perspective of the

[3] See http://www.un.org/en/sustainablefuture/.

economy and its economic units and incorporates relevant environmental information concerning natural inputs, residual flows and associated environmental assets. In contrast, SEEA-EEA 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.

SEEA–EEA 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-EEA 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.

This report is set out in three parts.

Part 1 (Section 3) provides a global and country rationale for undertaking environmental-economic accounting with an outline of the building blocks and methodologies needed for its implementation. This provides the context and rationale for the NP-AEEA, the high-level needs of Mauritius based on the assessment report and finally a summary of the key outcomes that could be achieved for Mauritius by implementing the NP-AEEA.

Part 2 (Sections 4 and 5) presents a brief overview of the building blocks and methods needed to implement the NP-AEEA. The aim of these sections is to provide generic guidance on a standardised approach based on current frameworks, system, methods and guidance and training material.

Part 3 (Sections 6, 7 and 8) outlines the details of a national program of work 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. These sections are specifically tailored to the needs of Mauritius using the building blocks and methods outlined in Part 2. 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.

The advantage of providing the three-part approach to developing an NP-AEEA 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 NP-AEEA identified in Part 3 will be used in the future to focus resources, research and training efforts.

3 ENVIRONMENTAL-ECONOMIC ACCOUNTING RATIONALE

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

3.1 Global perspective

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 of producing and reporting data for the Post-2015 Development Agenda and providing information for integrated decision-making.

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*[4] 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*".

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

Also in 2013, the UN published the *Guidelines on Integrated Economic Statistics*[5] 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 to enhance the quality and analytical value of the information the statistics convey for short-term, annual and benchmark economic 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. Integrated economic statistics 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.

[4] www.un.org/sg/management/pdf/HLP_P2015_Report.pdf.
[5] http://unstats.un.org/unsd/nationalaccount/docs/IES-Guidelines-e.pdf

In 2014 the report *A world that counts – mobilising the data revolution for sustainable development*[6] published by the Secretary General's Independent Advisory Group (IEAG)[7] 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".*

The SEEA is proposed as a common measurement framework for several environment, biodiversity and sustainable-development related international initiatives including the Post-2015 Development Agenda Sustainable Development Goals (SDGs), the OECD Green Growth initiative, the World Bank WAVES, IPBES, BIOFIN, Sustainable Consumption and Production, and the CBD Aichi Targets.

Intergovernmental negotiations on the Post 2015 Development Agenda have produced a draft document: *Transforming Our World: The 2030 Agenda for Sustainable Development*[8]. This document sets out 17 Sustainable Development Goals (SDGs) and 169 targets that build on the Millennium Development Goals (MDGs).

Regular reporting on SNA and SEEA accounts will support the production of indicators to monitor at least 12 of the SDG goals:

- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture,
- Goal 6: Availability and sustainable management of water and sanitation,
- Goal 7: Access to affordable, reliable, sustainable, and modern energy,
- Goal 8: Sustainable economic growth,
- Goal 9: Industry, innovation and infrastructure
- Goal 10: Reduced inequalities
- Goal 11: Safe, resilient and sustainable cities,
- Goal 12: Sustainable consumption and production,
- Goal 13: Combat climate change and its impacts,
- Goal 14: Sustainable use of oceans, seas and marine resources,
- Goal 15: Sustainable use of terrestrial ecosystems, especially 15.9 integrating ecosystem and biodiversity values into national and local planning and development processes and poverty reduction strategies and accounts, and
- Goal 17: Enhancing capacity building to increase availability of data.

Therefore, implementing the SEEA addresses not only national development objectives, but serve the purpose of international reporting as well.

[6] http://www.undatarevolution.org/.
[7] Independent Expert Advisory Group on a Data Revolution for Sustainable Development.
[8] https://sustainabledevelopment.un.org/post2015/transformingourworld.

3.2 Country perspective

The policy context for SEEA implementation in Mauritius is broad. It ranges from the general direction setting in the Blueprint for Vision 2030 to sectoral policies in relevant line ministries. There are many relevant programs and projects concerning topics such as green and ocean economy, sustainable consumption and production, climate change, land use and sustainable development indicators. These all have links to information that may be sourced from SEEA based accounts.

Mauritius has been promoting sustainable development as a way to address its unique vulnerabilities and opportunities as a Small Island Developing State (SIDS). The Blueprint for Vision 2030 and the complementary Green Economy Action Plan[9] are amongst its efforts for operationalizing across dimensions of sustainable development. One of the major opportunities for action to make possible the transition of Mauritius to a green economy is to build resilience and increase the adaptive capacity of the country.

3.2.1 Blueprint for Vision 2030

The Blueprint for Vision 2030, which is expected to set the stage for a more detailed Economic Development Plan, sets out four overriding objectives:

1. Address unemployment
2. Alleviate, if not eradicate, poverty,
3. Opening the country [to investment] and air access policies,
4. Sustainable development through innovation

This builds on the Maurice Île Durable (MID) concept that was developed in response to the global energy crisis in 2007.and emphasized the importance of promoting renewable energy and sustainable development for the well-being of its citizens. The Blueprint challenges the public and private sectors, NGOs, organized labour and civil society to collaborate to achieve this single economic vision. It notes that civil servants must be active drivers in the nation building process, encouraging them to adopt a new efficient and creative mindsets that focus on national targets.

The Blueprint focusses on three core initiatives:

1. Promoting a revamped and dynamic manufacturing base, including port expansion,
2. Leveraging the Exclusive Maritime Zone to develop the ocean economy, especially fishing and tourism, and
3. Expanding high-value added services and activities, especially the financial services sector; the innovation, technology and communications sector; life sciences research and development and the higher education sector.

3.2.2 Green Economy Action Plan

The Green Economy Action plan for Mauritius represents steps and actions that the country must take in order to transform its economy towards an inclusive and green one. In provides a

[9] The Green Economy Action Plan is being reviewed by UNDP and has not yet been finalized or approved by the Government of Mauritius.

clear path describing the steps and actions as well as the required timelines in the transitioning to an inclusive Green Economy. It is also expected to enhance partnerships and ensure coherence between the activities and the various stakeholders.

The Maurice Île Durable Commission, which ended its mandate in late 2014, produced a draft Green Economy Action Plan (GEAP), in conjunction with the University of Mauritius, as MID's principal submission to these planning processes. However, the plan, which set specific targets for each economic sector, has not yet been finalized or approved by the Government of Mauritius (as per SPU).

3.2.3 Partnerships for Action on Green Economy (PAGE)

The Partnership for Action on Green Economy[10] (PAGE), comprising the UN Environment Programme (UNEP), the International Labour Organization (ILO), the UN Industrial Development Organization (UNIDO) and the UN Institute for Training and Research (UNITAR), and now includes the United Nations Development Programme (UNDP).

PAGE is a response to the Rio+20 outcome document *The Future We Want*, which recognizes green economy as a vehicle for sustainable development and poverty eradication. PAGE aims to support 30 countries over the next seven years, in building national green economy strategies in order to generate new jobs and skills, promote clean technologies, and reduce environmental risks and poverty.

The PAGE Partners have already supported a number of green economy initiatives in Mauritius including the Africa Adaptation Programme for Mauritius partly funded by UNDP, the Green Jobs reports funded by ILO, the Climate Change Adaptation Programme in the Coastal Zone of Mauritius and the ongoing green economy assessment that will feed into an action plan.

Mauritius had been a frontrunner in the context of a Green Economy, establishing in 2008, the Maurice Île Durable (MID) Sustainable Development Vision for Mauritius.

PAGE conducted a scoping mission in July 2014 in Mauritius to support on-going national green economy (GE) planning efforts, explore options for medium-term support, and manage stakeholder expectations in collaboration with MIDC. It proposed to strengthen the capacities of national stakeholders through a climate change adaptation and mitigation expenditure and institutional review, with a view to assess and strengthen the efficiency and effectiveness of public expenditure and institutional mechanisms for climate change adaptation and mitigation.

Four key objectives of this Public Expenditure and Institutional Review in Climate Change Adaptation and Mitigation are to:

- Assess public expenditure, both capital and recurrent, in the areas related to climate change, adaptation and mitigation as the current fragmentation of funding and public institutions makes it difficult to provide a consolidated view.
- Assess the outputs delivered and outcomes achieved through public expenditure in adaptation and mitigation of climate change. Comparison of public expenditures of Mauritius on climate change adaptation and mitigation with those of other countries,

[10] http://www.unep.org/greeneconomy/PAGE.

with similar level of development, and facing similar challenges climate change, will provide benchmarks to assess the efficiency of climate change finance in Mauritius.
- Provide concrete recommendations to strengthen the efficiency and effectiveness of public expenditure and institutional mechanisms for climate change adaptation and mitigation.
- Identify international resources and strengthen capacity to effectively tap into international funds that are being made available for climate change adaptation and mitigation.

3.2.4 Other relevant initiatives

There has been a strong commitment from the Government of Mauritius to integrating its National Statistical System, in part though the implementation of the SEEA. This is demonstrated by the range of initiatives related to improving information on sustainable development:

- **Statistics Mauritius**:
    - has compiled initial SEEA-CF accounts for energy, greenhouse gas (GHG) emissions, water supply and use[11] and material flows.
    - is currently embarking on a project to develop statistical business register under the Statistical Capacity Building Programme of the **African Development Bank** (AfDB). A business register is important for environmental-economic accounting, since it supports the geolocation of businesses and their impact on and dependence on the environment.
    - has embedded staff in other departments to facilitate the transfer of aggregate information to Statistics Mauritius.

- The **Indian Ocean Commission** (IOC)
    - in collaboration with MID Commission and Statistics Mauritius led the production of the Experimental Ecosystems Natural Capital Accounts from 2000-2010 that covers: 1) land cover and changes, 2) ecosystem biomass-carbon accounts, 3) ecosystem water account, 4) ecosystems integrity/biodiversity account, and 5) calculation of ecosystem capabilities.

- **Ministry of Finance and Economic Development** (MoFED) welcomes and encourages any exercises that take into account of sustainability, climate change and environmental protection in the national planning process. It called for the development of statistics and indicators for green economy measurement and fiscal assessment and performance measures of the Green Economy Action Plan.
- **The Ministry of Environment, Sustainable Development** and Disaster and Beach Management (MoESD):
    - has been involved in several projects at present or in the past that aim at improving environmental data to support environmental policy and impact assessment: Mauritius Outlook Report, African Environmental Information Network (AEIN) project; Integrated Coastal Zone Report, and Digest of Sustainable Consumption and Production.
    - has already integrated much of its information within an integrated information system

[11] See http://statsmauritius.govmu.org/English/StatsbySubj/Pages/Environment.aspx.

- **The Ministry of Foreign Affairs, Regional Integration and Foreign Trade** is setting up a technical committee to address the Sustainable Development Goals (SDGs).
- The **Ministry of Ocean Economy, Marine Resources, Fisheries, Shipping and Outer Islands** is developing an integrated environmental information system.
- The **Ministry of Housing and Lands** is developing a National Spatial Data Infrastructure.
- The **Ministry of Energy and Public Utilities** requires integrated information collected by other departments on energy and water use.

3.3 Mauritius environmental-economic accounting needs assessment

3.3.1 Environmental-Economic Accounting

Mauritius' statistical system is well established and covers many aspects of economic, social and environmental measurement. It continues to seek improvement in the development of its statistics with the vision to become a leading statistical organization in the region.

The Director of Statistics Mauritius is responsible for both the operations of Statistics Mauritius and the National Statistical System. That is, the position includes the mandate to influence the nature and quality of data collected by other agencies.

Discussion and investigation on the implementation of the SEEA in Mauritius initially arose in the context of the MID Strategy and Action Plan. In recognition of the need for robust statistics and environmental-economic accounts to respond to the growing demand in monitoring sustainable development, several accounts were piloted.

The first sets of Environmental-Economic Accounts were compiled through the UNDP technical assistance programme 2008-2010. UNDP consultant, Rocky Harris, undertook three missions to compile 3 sets of priority accounts, namely: (1) Energy/GHG emission emissions accounts, (2) Water use accounts, and (3) Material flow accounts from 2002 to 2009. Although the energy and material flow accounts have not been updated, these accounts could form the basis for the next phase of work for the implementation of the SEEA.

From 2011-2013, UNSD supported capacity building of the SEEA Water Accounts with technical assistance from Ricardo Martinez-Lagunes, Inter-regional Advisor on SEEA. The work led to the publication of Water Account Mauritius 2013 Report[12].

In 2012, the Indian Ocean Commission (IOC), in collaboration with MID Commission and Statistics Mauritius, supported the development of ecosystem accounting with technical assistance from Jean-Louis Weber through the regional project, ISLANDS funded by the European Fund of the European Union. The first phase of the project was completed in 2014 and led to the publication of the Experimental Ecosystems Natural Capital Accounts from 2000-2010 that covers: (1) land cover and changes, (2) ecosystem biomass-carbon accounts, (3) ecosystem water account, (4) ecosystems integrity/biodiversity account, and (5) calculation of ecosystem capabilities. These accounts are in provisional, but could serve as reference for testing of the SEEA Experimental Ecosystem Accounting in Mauritius.

12 http://statsmauritius.govmu.org/English/StatsbySubj/Documents/quality%20of%20life/Water%20Account,%20Mauritius%202013.pdf.

Statistics Mauritius is currently embarking on a project to develop statistical Business Register under the Statistical Capacity Building Programme of the African Development Bank (AfDB). The project is developed in 8 phases[13]. In developing the Business Register, it is recommended that geospatial reference unit and SEEA related data items should be included in the business register for linking geospatial information with establishments.

Input and output tables are published every 5 years for benchmarking purpose. The latest input-output table is for the year 2007.

3.3.2 Integrated statistics and spatial information

All stakeholders consulted have expressed the need for integrated statistics and spatial information to address their new mandates. The exchange of information between departments has generally been limited to aggregate statistics. Legislation establishing the role and guiding the activities of government ministries prevents them from exchanging detailed data. There are also concerns that ministries will lose control of their data once it is shared.

3.3.3 Opportunities and constraints

Opportunities

Advancing the SEEA is an opportunity to take advantage of the government-wide need and desire to integrate its information to address policies for sustainable development. The need to address the Blueprint for Vision 2030 and SDGs can serve as the main drivers for this. Since both initiatives are still in the developmental stages, there is an opportunity to include the need for integrated statistics in the national vision for economic development and to ensure that the process for developing indicators for the SDGs motivates the capacity to develop new and integrated statistics.

The Ministry of Foreign Affairs, Regional Integration and Foreign Trade is setting up a technical committee to address the Sustainable Development Goals (SDGs). This is an opportunity to engage a broader range of stakeholders in the process.

[13] The Mauritian Government is participating in the Statistical Capacity Building Program of the AfDB. In this context a letter of agreement has been signed with the AfDB for obtaining a grant to, among others, develop a Business Register in the country that will also be used as a generic model on the African Continent.

A Business Register (BR) is a register of all enterprises (including government units), and the activities carried out by organisations that are active in the national economy, i.e. contributing to the Gross Domestic Product (GDP). It is the main source for business demography, as it keeps track of business creations and closures as well as the structural changes, brought about by operations such as changes in activities carried out by the organisation. The main purpose of a BR is to provide an up to date survey frame for all business surveys. It will also serve as an integrated microdatabase for economic data. The development of the SBR will take place in 8 phases, as follows:

Phase	**Deadline**
Phase 1: SBR Data Structures and Data Requirements	May 2014
Phase 2: SBR Outputs and Administrative Data Acquisition Arrangements	July 2014
Phase 3: SBR Inputs and Administrative Data Loading	February 2015
Phase 4: Reconciliation of SBR with LLEE* data	April 2015
Phase 5: Incorporation of SEE** into the SBR Complex	June 2015
Phase 6:Transfer of the other economic surveys to the SBR	Dec 2015
Phase 7: Respondent Burden and Quality Management	Mar 2016
Phase 8: Use of Administrative and Statistical Data in Place of Survey Data	June 2017

**List of Large Enterprises and Establishments*
*** Survey of Employment and Earning*

Statistics Mauritius is in the process of revising its Strategic Plan. The new plan should recognize the benefits of increasing the capacity and influence of Statistics Mauritius to work across departments to build a coherent statistics/science/policy interface.

All ministries are in the process of developing Action Plans to address their new mandates. This is an opportunity, as well to plan mechanisms to share data among ministries, especially Statistics Mauritius, with the intent of developing a common information infrastructure including spatial data.

The civil service is scientifically and technically capable. Previous experiences in piloting environmental-economic accounts has created a valuable community of practice that understands and can take advantage of the statistical, scientific and political principles required to establish integrated statistical processes to address policy questions.

The private sector is already engaged in the development of the Blueprint for Vision 2030 . Businesses are also being trained in conducting corporate sustainability reporting along Global Reporting Initiative (GRI) guidelines. This is an opportunity to leverage the interest of the private sector by engaging them in the development of integrated information through environmental-economic accounting.

Constraints

The main constraints to further progress in environmental-economic accounting are (a) inadequate data sharing mechanisms, (b) the lack of funding and staff for data development and integration, (c) the limited role of analytical staff to engage in planning.

While all stakeholders agreed that there is a pressing need for harmonizing information across the government, a major constraint to developing integrated information is the legislated confidentiality of data collected by agencies. That is, they are restricted in what they can share with other departments. This is in addition to limitations on collecting data on private lands.

Most departments noted that they have neither sufficient people nor technical capacity to conduct analysis of environmental-economic issues, such as valuing ecosystem services and integrating data from various sources.

The ability of analytical staff to engage in integrated planning exercises has been constrained by staff reallocations and the narrowing of job descriptions.

There is no immediate source of funding to implement environmental-economic accounts and support an ecosystem account pilot. While good potential exists, there are likely to be important challenges to overcome in implementing multiple SEEA accounts and to compile them on a regular basis. These challenges are particularly important to overcome to avoid SEEA implementation becoming an *ad-hoc*, one-off exercise rather than an ongoing statistical production process.

3.3.4 Conclusions

A government-wide statistical infrastructure based on an accounting approach, guided in part by expanding the SEEA-CF accounts and testing the SEEA-EEA, would support streamlining and mainstreaming several initiatives focussed on addressing sustainable development priorities. Streamlining would reduce costs through improving the efficiency of data collection

and interpretation by working within a common statistical infrastructure (among others, the UNECE Generic Statistical Business Process Model--GSBPM[14]) and coherent quality guidelines provided by the Quality Assurance Framework, SNA 2008, and SEEA-EEA).

Mainstreaming these initiatives would be supported by the creation of new data and indicators that could directly report on environment-economy trade-offs.

Given this context, this assessment indicates the need for a 3-5 year work plan focussed on (a) developing a comprehensive environmental-economic accounting information system; (b) assessing and integrating existing spatial data required to support expanded SEEA-CF accounts and to pilot ecosystem accounts; (c) conducting training and capacity building in environmental-economic accounting including ecosystem accounting; (d) enhancing coordination with national initiatives as well as international and donor agencies; and (e) immediately beginning work on priority accounts including Ecosystem Extent and Condition Accounts, Water Accounts, and Ecosystem Services Supply and Use Accounts, especially with respect to food security and water security, and putting the piloted SEEA-CF accounts (energy, water and materials) into ongoing production. These aspects are elaborated below:

- **Developing a comprehensive environmental-economic accounting information system** would build on the existing SEEA-CF accounts and further enhance the existing statistical infrastructure with an integrated common spatial data infrastructure, tools and techniques for spatially-detailed and harmonized information on the characterization and use of land, rivers, coastal and marine areas, protected areas and other special ecosystems (such as buffer zones), as well as local area data on the population and the economy;
- **Assessing and integrating existing data required to support expanded SEEA-CF accounts and to pilot ecosystem accounts** would provide coherent data from across the government to link the SEEA accounts with national and international requirements for sustainable development indicators;
- **Conducting training and capacity building in environmental-economic accounting including ecosystem accounting** across the range of stakeholders would provide a common set of skills across the National Statistical System to support improved statistical process management and data integration;
- **Enhancing coordination with national initiatives, as well as international and donor agencies** would promote the concept of a single National Statistical System and lead to efficiencies in improved data quality and reduction of duplication of effort;
- **Immediately beginning work on priority accounts including Ecosystem Extent and Condition Accounts, Water Accounts, Ecosystem Services Supply and Use Accounts** would take advantage of the current momentum to produce:
    - Spatially-detailed pilot **Ecosystem Extent Accounts**, recording ecosystem types (terrestrial, freshwater, coastal and soil) and their use and ownership, as well as changes over time and the attribution of those changes to natural and socio-economic drivers;
    - Spatially-detailed pilot **Ecosystem Condition Accounts** that record the biophysical characteristic and quality of ecosystem assets, focussing initially on the condition of coral reefs,

[14] http://www1.unece.org/stat/platform/display/GSBPM/GSBPM+v5.0

- Spatially-detailed pilot **Water Accounts**, recording the stock, flow, quality and availability of water to humans and ecosystems as well as changes over time and the attribution of those changes to natural and socio-economic drivers;
- Initial **Ecosystem Services Supply and Use Accounts** that will require case studies linking ecosystem condition and capacity with the general supply of ecosystem services, especially food security and water security;
- Updated SEEA-CF accounts (water, energy, materials) as well as feasibility studies for waste and air emissions accounts.
- These accounts could be supported by case studies that link conditions of these ecosystem assets with **supply of ecosystem services** such as food security and water security;
- **Feasibility studies** for developing further pilot SEEA-EEA accounts such as: Carbon Accounts focussing on biocarbon, Biodiversity Accounts and Ecosystem Capacity Accounts relating Ecosystem Extent and Condition to the supply of ecosystem services.

The programme of work would address national priorities by building on the strengths and addressing the constraints. These strengths include a well-coordinated national planning system, excellent technical capacity and collaboration in environmental statistics, availability of some key datasets and broad engagement of several stakeholders on environment-economy related issues.

However, engaging in such a programme of work would need to address constraints by:

- Developing sources of funding,
- Improving harmonization of the National Statistical System, including mechanisms for data integration and sharing,
- Building technical capacity through training and collaborative work experience,
- Increasing collaboration and coherence between key stakeholders (national, provincial, local, universities, NGOs, international agencies),
- Developing key datasets (land cover, land use, land ownership, spatially-detailed data on water supply and use and economic activities, a spatially-referenced Business Register), and
- Building the awareness of stakeholders and civil society of the importance of ecosystems to people and encouraging a culture of measurement.

Such a programme of work would be an opportunity to create a sustainable statistical infrastructure for coherent reporting and monitoring of national policy priorities and programs related to natural resources including ecosystem and their services. Building such an infrastructure would leverage on existing capacities and create new ones through engagement of stakeholders, increased harmonization of the National Statistical System, developing essential new datasets, improving awareness and building technical capacity.

To engage in such a programme of work, however, will require a 9-12 month design phase to develop the institutional and legal infrastructure and to build technical capacity. This design phase should focus on three elements:

- Establishing a national vision and legal mandate for integrated statistics to support integrated policies,

- Establishing the institutional infrastructure for linking the development of this integrated information to the policies that require it, and
- Building technical capacity, developing funding mechanisms for agencies to better support the development and analysis of integrated information, and producing a coherent plan for a longer-term collaborative effort to prototype the first accounts.

4 NP-AEEA – HIGH LEVEL OUTCOMES

It is important to link proposed activities with their ultimate outcomes. This section summarises the key outcomes that could be achieved for Mauritius by adopting and implementing the NP-AEEA. In the Section **NP-AEEA—Investment Logic Framework,** a program of activities is detailed showing the timelines and steps needed to achieve the outcomes:

1. A comprehensive environmental-economic accounting information system that responds to the requirements for information on sustainable development and green economy;
2. Integrated and improved data required to support updated and expanded SEEA-CF accounts and to pilot SEEA-EEA ecosystem accounts;
3. Enhanced capacity across the National Statistical System in environmental-economic accounting including ecosystem accounting;
4. Enhanced coordination with national initiatives, as well as international and donor agencies; and
5. A set of priority accounts, namely Ecosystem Extent and Condition Accounts, Water Accounts, Ecosystem Services Supply and Use Accounts for food and water security, cases studies of linkages between ecosystem condition and services, and feasibility studies for Carbon, Biodiversity and Capacity accounts.

5 PROGRAM OF WORK BUILDING BLOCKS

This section and the following section on **Methodologies** provide a brief overview of the building blocks and methods needed to implement the NP-AEEA. 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.

The Guidelines on Integrated Economic Statistics (IES)[15] suggest three main interlinked and mutually reinforcing building blocks for developing integrated statistical systems: conceptual organizing frameworks, institutional arrangements and statistical production processes. Linking these to the needs assessment and high-level outcomes sections above, the building blocks when applied to the **NP-AEEA – Investment Logic Framework**, are:

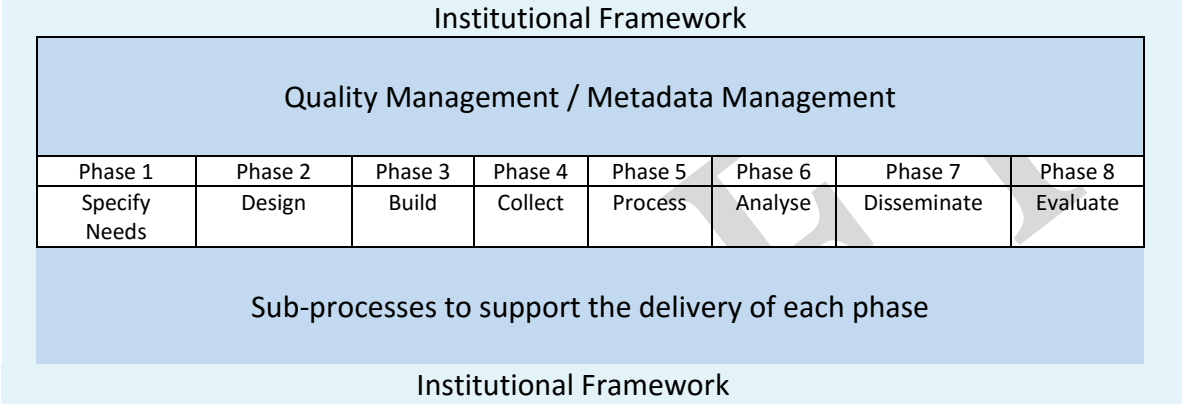
1) Mainstream the Environmental-Economic Accounting Frameworks
2) Rationalise and Integrate Institutional Arrangements
3) Integrate the Data, Tools and Statistical Production Process
4) Ecosystem Accounting Experimentation[16]

Blocks 1-3 are the core and required to achieve the overall aim and Block 4 ensures continuous improvement including research and development, testing and experimentation to adapt the guidelines of the SEEA to the country situation. The building blocks are combined with the GSBPM shown in **Figure 1**. The GSBPM describes and defines the set of business processes needed to produce official statistics. It provides a standard framework and harmonised

[15] http://unstats.un.org/unsd/nationalaccount/docs/IES-Guidelines-e.pdf.
[16] Experimentation has been added as an additional building block in support of SEEA EEA and the experimental nature of work needed.

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.

Figure 1 Generic Statistical Business Process Model (GSBPM).



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. 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. In addition, some sub-processes will be revisited a number of times forming iterative loops, particularly within the Process and Analyse phases.

GSBPM is 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.

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

5.1 Mainstream the environmental-economic accounting frameworks

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.

This building block aims to mainstream the environmental-economic accounting frameworks, and to structure it in stages 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 guides the development of the others and is necessary for their success.

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 natural resource and ecosystem values as assets that provide essential services.

These processes combine available knowledge from many disciplines and agencies including national statistics and accounting, management of energy, minerals, 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 that mainstreaming, adaptation and application of the available knowledge can occur.

5.2 Rationalise and integrate institutional arrangements

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.

Clearly, for any new system, process or framework that affects 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.

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 classification and measurement of important ecosystem assets in the landscape whereas an agricultural agency will focus on economic benefits of the same landscape. 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 across domains. Further, the movement towards a more integrated and streamlined process for the collection and publication of data provides opportunities for lowering the overall cost and increasing its use and efficacy.

This does not imply reducing the control that agencies have over their own data collection processes, but it does require rationalising the standards used for data collection and strengthening the NSS 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 NSOs.

5.3 Integrate the data, tools and statistical production process

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.

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 environmental data collection and production. 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.

Many of the tools and infrastructure required already exist. However, they operate on different platforms and standards making integration costly in both time and resources. In the medium to long term, the aim of the NP-AEEA 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. This would be followed by the development of a strategic investment plan for their integration.

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

5.4 Ecosystem accounting experimentation

There remains some 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.

Experimentation also serves as an important vehicle for mainstreaming 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.

Mauritius is well placed to participate in this experimentation, given the high-level interest in sustainable development and the need articulated among a range of stakeholders to assess the economic benefits of the sustainability efforts undertaken. This establishes the conditions for broad support for the SEEA approach in the country. Measuring marine ecosystems and their sustainable exploitation is not well developed in the SEEA. Mauritius, given their need to develop measures of the ocean economy, has an opportunity to be among the leaders in developing coherent approaches.

6 METHODOLOGIES

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 that delivers on the building blocks and the longer-term aim of the country. The advantage of having common methodological frameworks is to enable coordinated progress towards advancing environmental-economic accounting.

6.1 Institutional framework

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 that the outputs satisfy the needs of the stakeholders.

Designing, developing and implementing an integrated system of statistics is a large programme and requires a broad management strategy. 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.

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 Mauritius include:

- High level commitment, and engagement of partners; common coordination; data collection/sharing implications
- Advisory committees (IES[17], p. 39)
- Legislation, mandates to coordinate, produce, supply inputs etc.
- Inter-institutional commitments for production of integrated statistics – Memoranda of Understanding (MoUs) (IES, p.41)
- Inter-departmental commitments – Service-Level Agreements – (SLAs) (IES, p.42)
- Programme governance structure development

6.2 Roles and Responsibilities for Environmental-Economic Accounting

If agencies outside the NSOs are involved in the compilation and dissemination of official statistics, then for the creation of integrated system of statistics, it is necessary to create partnerships. The first step is to engage all relevant agencies in the discussion of the necessity and the mutual gains of improving integration within the NSS. This can only be done at the level of the top management. The next step is agreement on the possible new roles and responsibilities of the agencies in the new systems.

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 the experience gained. Initial design and testing will require attention to:

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

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

- Training sessions
- Customised communications plans

6.3 Environmental-economic accounts production process

The GSBPM Phase 3 (Build) and Phase 4 (Collect) are based on the understanding of the mechanics of delivering on a new system developed in Phase 2 (Design). This includes (but is not limited to):

- Data collection (or generation – through sampling, inventories/surveys, detailed process-modelling, spatial and remote-sensing applications)
- Data harmonization (processing, quality control, imputation)
- Determining accounting inputs
- Accounting outputs estimation
- Accounts validation

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

An important step is to carry out extensive experimentation to test whether methods and concepts are appropriate, and what data can be used or developed. 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[18], 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 to formally track progress

These methodological issues will be addressed in collaboration with an international community of practice on environmental-economic accounting and 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.

Accounting architecture

When designing new accounts, it is very important to ensure the timely availability of micro-data and the time required for processing. A part of the experimentation should be to test the design for feasibility within the business and software architecture. This will reveal any consequences for the Information Technology (IT) environment (Geographic Information Systems (GIS) capacity, running time, storage etc.). If the feasibility tests shows bottlenecks, one must make sure that they can be solved (at reasonable cost) before the next phase can start. Based upon the (adapted) design, the experimentation, the estimated costs and benefits, a

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

decision must be made whether the programme is feasible and acceptable for all involved partners.

Information and decision support tools and architecture

Outside of statistical systems managed by NSOs, there are many systems in place for the collection and collation of data for decision-making. These include geographical information systems, biophysical models, agency databases, business and land registers and taxation registers.

Many of these are amenable to producing data that can be used for environmental-economic accounting, but they may require further to integrate with other systems. This area of experimentation is very important because there are significant opportunities to leverage the current system and to save resources.
It is important that experimentation have 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[19]
- Land offset programs for environmental purposes[20]
- Land use change programs for carbon sequestration[21]
- Trade-offs between optional uses of land in land use planning
- Setting priorities for conservation areas

Moving from experimentation to (national) production

Case studies, specialized national statistical collections, sub-national collections and experimental accounts all offer opportunities for scaling up to national-level GSBPM-compliant statistical processes. Whether or not these have been conducted according to Phases 1 through 7 of the GSBPM, there will still be effort required to ensure that these collections are brought into compliance in terms of quality, consistency in concepts, resourcing and long-term planning.

The recommended approach to accomplishing this is for the NSO to assess a candidate data collection with respect to quality and coherence with the SEEA. In the case of well-established collections, the project team will need to decide how the collection may be adapted to the national standard without affecting its original purpose. For example, crosswalks may need to be developed for classifications and more stringent quality guidelines and documentation may need to be developed. After assessment and integration, the project team is in a position to produce a work plan that specifies the timelines, resources required to produce the expected outputs.

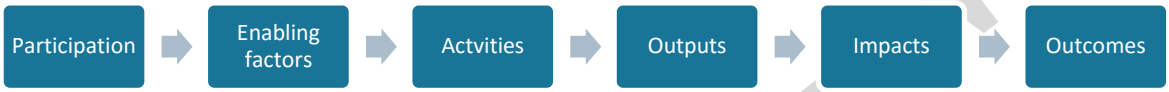
This scaling up of existing work should be seen as a national strategic investment, since it will (a) make a new data source available to address national policy priorities at a relatively low cost, (b) improve the consistency and coherence of existing data collection activities and (c) provide new uses and users for existing data.

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

7 NP-AEEA – INVESTMENT LOGIC FRAMEWORK (ILF)

The ILF provides a structured approach to analysing the suite of optional activities that may be undertaken to achieve the desired outcomes (See **Figure 2** below and in more detail in **Figure 3** in **Section 9**). The ILF should not be seen as a series of steps to be followed consecutively, but as key elements that are essential to the effective delivery of outcomes.

Figure 2. Investment Logic Framework



Participation and Enabling Factors – it is important to identify stakeholders that need to participate and to 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 may require changes in institutional arrangements before statistical development activities commence. Additional resources may need to be allocated to achieve an enabling factor, so it is important for participants to be very clear from the outset what their involvement may mean.

Activities and 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. Achieving one output may require several activities. It is important to ensure that each activity can be linked to an output to ensure its relevance and timing. Finally, outputs can be linked to impacts and outcomes.

Impacts and 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 observed change 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 and enabling factors

7.1.1 Coordination with development partners in Mauritius

Several government institutions in Mauritius are involved in providing and using sustainable development information:

- Statistics Mauritius
- Ministry of Environment, Sustainable Development and Disaster and Beach Management (MoESD)
- Ministry of Finance and Economic Development (MoFED)
- Ministry of Agro-Industry and Food Security
- The Strategic Policy Unit (SPU) of the Prime Minister's Office
- Ministry of Ocean Economy, Marine Resources, Fisheries, Shipping and Outer Islands
- Ministry of Foreign Affairs, Regional Integration and Foreign Trade
- Ministry of Housing and Lands
- Ministry of Energy and Public Utilities
- Ministry of Social Integration and Economic Empowerment
- Food and Agricultural Research Extension Institute
- Accountant General in the Office of Public Sector Governance

- The Bureau of Standards
- Albion Fisheries Research Centre

As well, these agencies work closely with international and regional partners, such as:

- The Indian Ocean Commission (IOC)
- The African Environmental Information Network (AFIN)
- The African Development Bank (AfDB)
- United Nations Development Programme (UNDP)

7.2 Enabling factors

Existing policies and initiatives the can be informed by and can inform SEEA implementation include:

- The Blueprint for Vision 2030
- The Green Economy Action Plan
- Partnerships for Action on Green Economy (PAGE)

A range of projects already completed or that are in progress in Mauritius are directly relevant to environmental-economic accounting. Projects and activities identified include:

- Statistics Mauritius has developed pilot SEEA-CF accounts for energy and GHG emissions, water and material flows. They have also developed experimental natural capital accounts that include 1) land cover and changes, 2) ecosystem biomass-carbon accounts, 3) ecosystem water account, 4) ecosystems integrity/biodiversity account, and 5) calculation of ecosystem capabilities.
- MoESD has been involved in several projects at present or in the past that aim at improving environmental data to support environmental policy and impact assessment: Mauritius Outlook Report, African Environmental Information Network (AEIN) project; Integrated Coastal Zone Report, and Digest of Sustainable Consumption and Production.

Institutional mechanisms exist for the coordination of broad sustainable development issues:

- The mandate of MoESD includes the coordinate Sustainable Development through a participatory process including compliance with international environmental conventions and protocols.
- The Statistics Board "is mandated to offer guidance to the Minister responsible for statistical matters and other producers of statistics on the directions and priorities for official statistics[22]." Membership includes senior representatives of the public and private sectors as well as academia.
- The High-Power Committee to address the Vision 2030 is the lead organization in the development of the new Economic Development Plan.
- Members of the Technical Committee established to address the MDGs already have substantial experience in bringing together integrated information.

7.2.1 Planning and coordination

Planning and coordinating the implementation of the NP-AEEA will require a high-level SEEA Steering Committee. This would provide a forum for senior representatives of core stakeholders: Statistics Mauritius, MoESD, MoFED, the Ministry of Foreign Affairs, the

[22] http://statsmauritius.govmu.org/English/AboutUs/Pages/Functions-and-Membership.aspx.

Ministry of Ocean Economy and the SPU to set priorities and coordinate the work. This would be most effective as a sub-committee to the High-Power Committee to address Vision 2030.

Terms of Reference for the Steering Committee would need to be developed. Key responsibilities include:

- Ensure the establishment and effective function of Technical Committee (described below), and monitor its work,
- Develop, endorse and advocate the NP-AEEA within the government and with relevant international agencies by:
    - maintaining a focus on the need for integrated statistics in the national vision and ensuing development plans,
    - coordinating with relevant data collection and capacity building activities,
- Facilitate the mobilization of legislation and resources necessary for the production of the accounts,
- Monitor the progress towards the production of priority environmental-economic accounts and related outputs (spatial datasets, collaborative databases, indicators, case studies)

A Technical Committee would include senior experts from institutions represented on the Steering Committee as well as representatives from the -(include in steering committee , the Ministry of Agro-Industry, the Ministry of Housing and Lands, the Ministry of Energy and Public Utilities, , the Bureau of Standards, the Food and Agricultural Research Extension Institute, theMinistry of , (As per Act, the functions of the board are advisory ones not technical issues) ,the IOC as well as invited members from the private sector, NGOs, organized labour and civil society.

Terms of Reference for the Technical Committee could include the responsibilities to:

- Under the guidance of the Steering Committee, coordinate technical aspects of implementing the work plan by:
    - Establishing Working Groups in keeping with priorities established in the work plan by allocating appropriate staff and necessary resources
    - Coordinating the work of the Working Groups by setting priorities, reviewing and revising specific work plans, fostering collaboration, and promoting capacity building
    - Coordinating technical work with related national and international initiatives
    - Internalize activities of the Working Groups into planning and policy documents
- Reporting on priorities, plans and progress to the Steering Committee

Specialized Working Groups would address the priorities set by the Technical Committee to design and build the information system, undertake data collection, processing and analysis. In keeping with the principles of the GSBPM, the work is ideally organized into groups of subject-matter experts and functional experts.

The subjects of the initial accounts to be developed include Ecosystem Extent and Condition Accounts, Water Accounts and Ecosystem Services Supply and Use. This would result in the establishment of three subject matter Working Groups: the Ecosystems Working Group, The Water Working Group, plus a SEEA-CF Accounts Working Group.

Responsibility for ecosystem services related to food security could be assigned to an Ecosystems Working Group. Ecosystem services related to water security could be assigned to the Water Working Group. The Working Group on SEEA-CF Accounts would support the further development of the SEEA-CF accounts.

Rather than duplicating the capacity to integrate spatial data, classify data and to maintain quality standards, a separate functional group could be assigned to support all three subject matter groups. This results in four initial working groups, which could be expanded as work becomes more specialized or covers more accounts:

- Ecosystems Working Group:
    - inventory, compile and analyse data on ecosystem assets (land, rivers and ocean ecosystem and their condition),
    - design and produce Ecosystem Extent and Condition Accounts, tables and indicators,
    - conduct case studies on linkages between ecosystem extent, condition and the supply of services;
- Water Working Group:
    - inventory, compile and analyse data on water stocks, supply and demand (including water quality and the provision of water to ecosystems),
    - design and produce Water Accounts, tables and indicators,
    - provide water quality data to Ecosystems Working Group;
- SEEA-CF Working Group:
    - Harmonize work on valuation for Ecosystems and Water Working Groups; ensure consistency with SEEA-CF and SEEA-EEA guidelines;
    - bring existing SEEA-CF accounts (water, energy, materials) into ongoing production; and
    - assess the feasibility new SEEA-CF accounts (waste, air emissions).
- Functional Working Group:
    - design and build the spatial information system,
    - develop and maintain data quality standards,
    - provide GIS and data processing support to other Ecosystems and Water Working Groups.

In principle, the membership of each Working Group would be working-level staff drawn from the stakeholders represented in the Technical Committee. This will need to reflect the particular account being developed, but in general would need to contain representatives from the physical sciences, ecology, economics, accounting, geography, information technology 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 in each Working Group.

Each of the Working Groups would need to meet regularly, on the order of once per month in the first 1-2 years, and less frequently after that (3-4 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.

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).

At least once a year, all Working Groups should come together to report progress, share experiences and revise their work plans.

As part of the planning and coordination phase, each of the Working Groups would produce a detailed project plan for each of the priority environmental-economic accounts.

7.3 Activities and outputs

Over the medium term, the pilot project will not only produce several pilot accounts, it will also produce prototype integrated indicators that address the needs of the Blueprint for Vision 2030 and the SDGs, and a coherent spatial database.

7.3.1 Building priority accounts based on policy needs

The need for a range of environmental and ecosystem 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 shown in **Table 1**, below.

Table 1. Overview of policies and accounts relevant to environmental-economic accounting in Mauritius

Type of account or aggregate	Policy or issue	Lead Agencies
Ecosystem Extent and Condition Account	• Blueprint for Vision 2030 • Green Economy Action Plan • SDGs	Statistic Mauritius, MoESD, MoFED, Ministry of Agro-Industry and Food Security, Ministry of Foreign Affairs, Ministry of Housing and Lands, Ministry of Ocean Economy, SPU
Water Account	• Blueprint for Vision 2030 • Green Economy Action Plan • SDGs	Statistic Mauritius, MoESD, , MoFED, Ministry of Energy and Public Utilities, Ministry of Ocean Economy, SPU
Ecosystem Services Supply and Use Account	• Blueprint for Vision 2030 • Green Economy Action Plan • SDGs	Statistic Mauritius, MoESD, MoFED, , Ministry of Foreign Affairs, Ministry of Ocean Economy, Ministry of Agri-Industry and Food Security
SEEA-CF Accounts (energy, water, materials)	• Blueprint for Vision 2030 • Green Economic Action Plan • SDGs	Statistic Mauritius, MoESD, MoFED, Ministry of Energy and Public Utilities, Ministry of Foreign Affairs

The priorities identified for the development of environmental-economic accounting were:

- Spatially-detailed pilot **Ecosystem Extent Accounts**, recording ecosystem types (terrestrial, freshwater, coastal and soil) and their use and ownership, as well as changes over time and the attribution of those changes to natural and socio-economic drivers;
- Spatially-detailed pilot **Ecosystem Condition Accounts** that record the biophysical characteristic and quality of ecosystem assets, focussing initially on the condition of coral reefs,
- Spatially-detailed pilot **Water Accounts**, recording the stock, flow, quality and availability of water to humans and ecosystems, as well as changes over time and the attribution of those changes to natural and socio-economic drivers;
- Initial **Ecosystem Services Supply and Use** Accounts that will require case studies linking ecosystem condition and capacity with the general supply of ecosystem services, especially food security and water security;
- Updated SEEA-CF accounts (water, energy, materials) as well as feasibility studies for waste and air emissions accounts.

- These accounts could be supported by case studies that link conditions of these ecosystem assets with **supply of ecosystem services** such as food security and water security;
- **Feasibility studies** for developing further pilot SEEA-EEA accounts such as: Carbon Accounts focussing on biocarbon, Biodiversity Accounts and Ecosystem Capacity Accounts relating Ecosystem Extent and Condition to the supply of ecosystem services.

Ecosystem accounts require greater spatial detail than most existing statistical processes.. This has significant implications for the primary data sources and information management systems and administrative arrangements needed to generate and access the data to populate the accounts.

Pilot accounts would be progressively produced and refined from mid-2016. Following the pilot production of each of the priority accounts, the aim should be to produce 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-economic accounts.

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

7.3.2 Capacity building

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

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

Human resource capacity

There will need to be some general training on environmental-economic accounting as well as more specific training on each of the accounts and the primary data sources used. The general training would occur as soon as possible in 2015, with more specialised training and technical support for each of the four types of accounts to follow in the second half of 2016.

Subsequently, additional detailed training and engagement is likely to be needed as the production of the pilot accounts and aggregates draws nearer.
In addition to in-country training, a range of other capacity building activities should be considered including:

- Government officials and other stakeholders participating in relevant international meetings such as the planned regional workshops on environmental-economic accounting;
- Use of distance or on-line learning;

- Placement of project staff in countries or international agencies with existing environmental-economic accounting programmes; and
- Sponsorship of account producers or users for relevant higher degree studies (e.g. on economics, ecology and accounting) in universities. Local capacity could be augmented by developing course material and establishing courses on environmental-economic accounting for Mauritius' universities.

Infrastructure

Ensuring that the account developers have the necessary information technology and data to support the development of accounts will also be important. This need is already being addressed in a number of current projects, such as the development of MoESD's and the Ministry of Ocean Economy's Environmental Information Systems and the Ministry of Housing and Lands Spatial Data Infrastructure. Collaboration on this project will ensure that all stakeholders will benefit from improved data sharing, integration and common protocols.

7.4 Impacts and final outcomes

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 expected as a result of the activities.

Table 2 provides a high-level assessment of the impacts linked to the activities.
The outputs are expected to contribute to the needs for a more integrated NSS and a more engaged and better-coordinated body of stakeholders. The contribution of the project to the sustainability of Mauritius's development initiatives depends on many factors, including unforeseen circumstances and events beyond the scope of the NP-AEEA. It has been the experience of the international statistical community that a robust and flexible NSS is an important tool in adapting to future uncertainties and future data needs.

Table 2 Linking activities to impacts

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

8 CONCLUSIONS AND NEXT STEPS

8.1 Conclusions

The focus of the NP-AEEA is on medium-term (3-5 year) activities that will produce substantial new information to address Mauritius' sustainable development policy priorities. This is the first stage of creating a common, cost-effective and sustainable statistical infrastructure for environmental-economic accounting. Maintaining the momentum generated by these medium-term activities by new data collection and continual improvement will require more than specific funding opportunities. It will also require embedding the activities into the functions of government and national planning processes.

The NP-AEEA provides the foundations to write proposals that provide full details for each activity and the funding required. It contains many of the elements needed to write a proposal including the policy priorities, the needs assessment and a set of activities that will advance environmental economic accounting.

Opportunities for funding come from many different sources: national initiatives, international agencies, national development agencies and the refocusing of current work. Such opportunities may be identified by anyone familiar with the NP-AEEA including senior and technical staff, planning and environmental agencies and the NSO. It is therefore important that all stakeholders are familiar with the NP-AEEA and bring such opportunities to the attention of the lead agency. To increase these opportunities, it is important that the NP-AEEA is summarized and presented at relevant meetings and made available to all agencies and published on the Internet.

8.2 Next steps

To progress from a plan to specific proposals requires:

(a) Adaptation of the NP-AEEA to needs of the sponsor and funding available; and
(b) Additional detail on participants, implementation, timelines, deliverables and budget.

8.2.1 Adaptation of the NP-AEEA to the needs of the sponsor

Most sponsors will indicate their interests in funding projects by distributing Terms of References (TORs) or Requests for Proposals (RFPs). This will be based on the sponsor's vision of what is required.

The interests of sponsors may be less comprehensive and integrated than those covered in the NP-AEEA. Generally, sponsors are looking for proposals that focus on specific aspects of environmental-economic accounting, such as biodiversity, ecosystem services, mapping, poverty alleviation, food security, etc. They may also be interested in specific ecosystem types: oceans, forests, rivers or ecological topics such as desertification, pollution or species loss. They may be looking to support feasibility studies, capacity building or valuation.

The NP-AEEA provides the foundations for most of the above proposal types and presents them as an integrated package. It also emphasizes the importance of a strong statistical infrastructure so that the results of any project will contribute to building technical, institutional and statistical capacity. Although the need to strengthen the NSS may not be mentioned in a sponsors TOR or RFP it is in the country's national interest to emphasize this in proposals.

A TOR or RFP will also suggest a maximum amount of funding for projects. Furthermore, sponsors often require co-funding. That is, a country is expected to contribute a proportion of the costs of the entire project. Co-funding may sometimes be stated in terms of "in-kind" contributions of human and other resources. How much funding is available and the willingness of national stakeholders to co-fund a project will determine which aspects of the NP-AEEA are included in any given proposal.

8.2.2 Additional Detail

The amount and nature of the detail contained in a proposal also depends on the expectations of the sponsor. Ideally, the proposal will link the expectations of the sponsor with the needs of the country.

Participants

The first step in developing a proposal is to assemble the team that may include departments, agencies and other stakeholders who will commit to participating in a project if it is funded. As noted above, this may also imply co-funding.

Implementation

The participants will need to come to an agreement on how a project will be implemented and how funds will be disbursed. For example, who will be the lead agency? What will be the governance structure? Ideally, multiple projects can be coordinated within the overall governance structure of the NP-AEEA.

Timelines

TORs or RPFs will usually specify the length of time for a project. If the funding is for one year, this will determine the nature of the activities and provide due dates for deliverables. It is important, not only for the proposal, but also for the implementation of the project to divide the project into steps (e.g., preparation, assessment, data collection, analysis, report production, review and evaluation) and to allocate sufficient time to each step. The timelines are also important to coordinate the participation of stakeholders.

Deliverables

Generally, TORs and RFPs require a very clear specification of the deliverables that are expected. They could be very specific such as “an assessment of…”, “a report on…”, “a database of…”, “training on…”. Or, they could be less specific such as “improving decision making on…”, “integrating…with…”.

In either case, the success of the project will be judged on these deliverables. It is important to be very clear on what deliverables the sponsor is expecting. Sponsors may wish to review progress during stages of the project. Sometimes payments are linked to progress at each stage. In this case, it is important to prepare documents that can be easily reviewed and show progress at each stage. For example, sponsors may wish to review a

Table of Contents of a report, then an annotated outline and then a draft.
Sponsors may also require structured progress reports as the project progresses. Resources for this planning, evaluation and reporting should be built into the proposal.

Budget

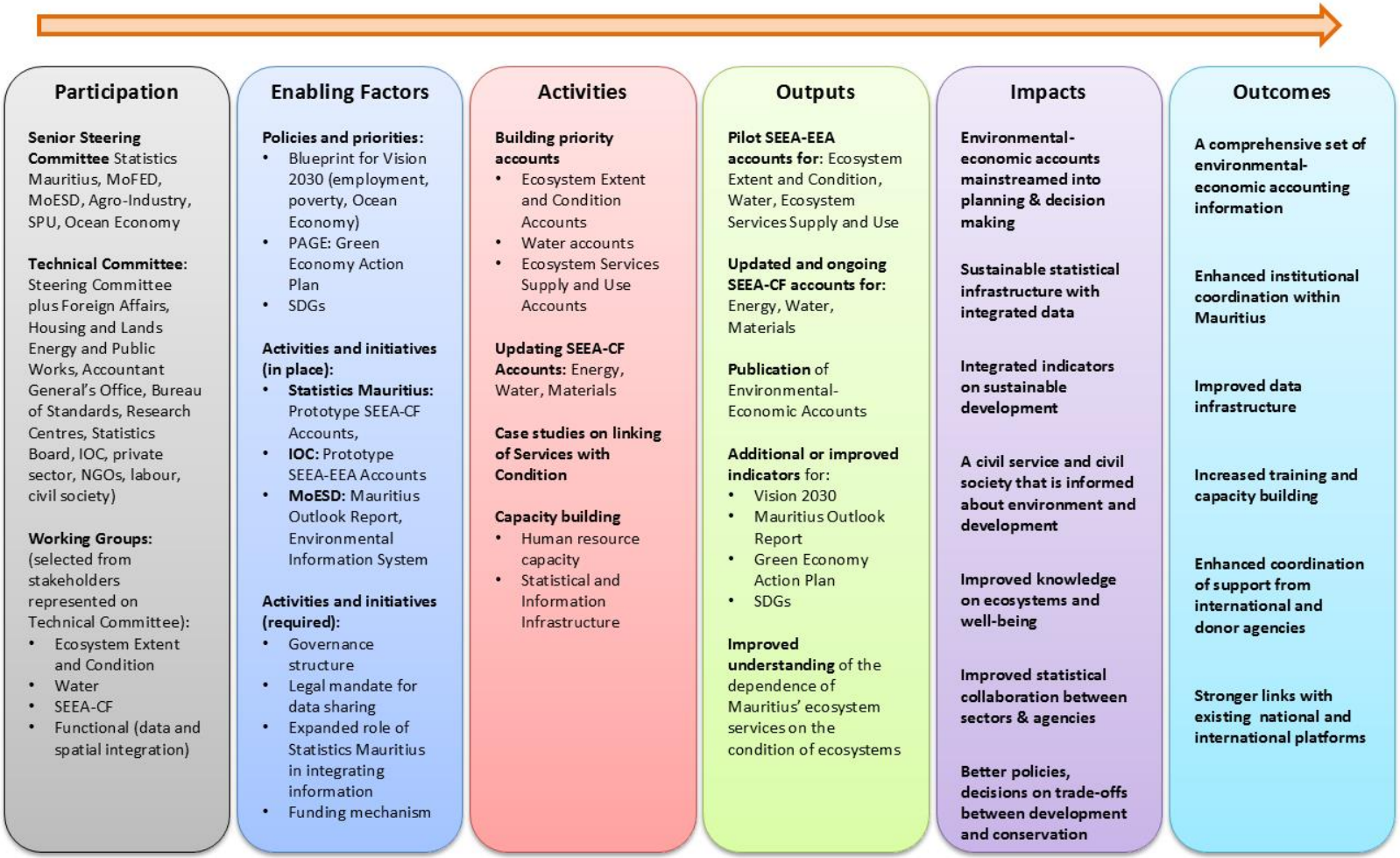
Within the funding limits of the project, it is important to estimate how much work can actually be accomplished. Costs that need to be taken into account are not only the salaries of core participants, but also the “overhead” of administration, capital equipment, data, translation (if necessary), travel, meeting venues, etc.

If this is to be a multi-year project, then a simple project plan (shown below) would help determine who is required at which stage and where other costed inputs are required. This is an opportunity to balance the year-to-year requirements. For example, an activity could be moved from one year to another if the project is expected to have the same cost for each year.

	Year																							
	2015				2016				2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Stage	Prep		Short-term								Medium-term													
Work Package	head count																							
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
FTE																								
Salary ($K)																								
Operations ($K)																								
Total ($K)																								
Annual ($K)			-				-				-				-				-					
Outputs																								

9 MAURITIUS - NP-AEEA – INVESTMENT LOGIC FRAMEWORK (ILF)

Figure 3 Provisional logic model for programme of work



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