



National Institute
for Science, Technology & Innovation

Strategic Plan

2018 - 2022



Foreword by the Minister

Acronyms

EEZ	Exclusive Economic Zone
BTI	Business Technology and Innovation
GDP	Gross Domestic Product
GERD	Government Expenditure on Research and Development
ICT	Information and Communication Technology
KAM	Knowledge Assessment Methodology
KBE	Knowledge-based Economy
KEI	Knowledge Economic Index
MDAs	Ministries, Departments and Agencies
MIEDBI	Ministry of Industry, Entrepreneurship Development and Business Innovation
MoE & HRD	Ministry of Education and Human Resources Development
MoFTEP	Ministry of Finance, Trade and Economic Planning
NBS	National Bureau of Statistics
NGO	Non-governmental organization
NIS	National Innovation System
NRF	National Research Foundation
P.E.S.T.L.E	Political, Economic, Social, Technological, Legal, Environmental
PM&E	Performance Monitoring and Evaluation
PPBB	Program Performance Based Budgeting
R&D	Research and Development
SADC	Southern African Development Community
SCCI	Seychelles Chamber of Commerce & Industry
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SMEs	Small and medium-sized enterprises
SOPs	Standard Operating Practices or Procedures
SRC	Seychelles Revenue Commission
STEM I&E	Science, Technology, Engineering and Mathematics, Innovation and Entrepreneurship
STI	Science, Technology and Innovation
SWOT	Strength Weakness Opportunities Threats
TOR	Terms of Reference
UNIDO	United Nations Industrial Development Organization

Table of Content

Foreword by the Minister.....	2
Acronym.....	3
Executive Summary.....	6
Introduction.....	7
Alignment with broader national context.....	7
Purpose of the Strategic plan.....	7
Methodology for the development of the strategic plan.....	8
Foundational sector analysis.....	8
SWOT Analysis.....	9
Vision and mission.....	11
Core Values.....	12
Strategic objectives.....	14
Strategic Choices:Overview of Sector policies, programmes and projects.....	18
New Spending Funded within ceiling.....	19
NISTI’s Structure and Function.....	21
Budget.....	25
Performance monitoring and evaluation.....	27
Descriptions for the core indicators.....	30
Change management.....	31
Conclusion.....	34
Annexure.....	35

List of Tables

Table No : 1 SWOT Analysis.....	9
Table No: 2 Strategic Objectives.....	14
Table No: 3 Strategic objectives to support the transition from an efficiency-driven to an innovation-driven knowledge-base economy.....	18
Table No: 4 New spending proposals to support strategic priorities.....	19
Table No: 5 Consolidated expenditure estimates.....	25
Table No: 6 Staffing Budget.....	26
Table No: 7 Performance Monitoring and Evaluation.....	27

List of Figures

Figure No: 1 Core Values.....	12
Figure No: 2 NISTI's Organizational Structure.....	21
Figure No: 3 Integrated STI Governance System.....	31
Figure No: 4 Basic KAM Score Card of Seychelles (December 2014).....	35
Figure No: 5 Basic Score card of Seychelles Compared to all other Countries.....	36
Figure No: 6 Comparative Scores of the K4 Pillars.....	37
Figure No: 7 Integrated STI governance System for Seychelles.....	39

Executive Summary

Seychelles has taken a strategic initiative of focussing on economic diversification through the development of a *Blue Economy* or an economy based on optimal and sustainable exploitation of its vast exclusive economic zone (EEZ) of 1.4 million square km. This has also changed the perspective of Seychelles from being viewed as a *Small Island Developing States* (SIDS) to a *'Large Blue Resource Nation'*. This will inturn necessitate huge investments in related research, technology and innovation activities in the field of *Biosciences* and the *Blue Economy*.

However, not enough is happening in research and innovation, despite progress in income and education standards. Despite the fact that there are a large number of national / sectoral policies, which implicitly promote Science, Technology and Innovation (STI) e.g Fisheries, Agriculture, Health, ICT, SMEs, Industrialisation, Tourism, etc., there was no explicit national policy framework which integrates STI into the national development strategy. Consequently, there existed a felt need in the Government and amongst the people to address this void through identification of shortcomings and relevant policy and strategy interventions. In mid-2015, the *High-Level Steering Committee for Knowledge Based Economy (KBE)* under the chairmanship of the Vice-President mandated NISTI to formulate a National Policy and Strategy for STI Management in Seychelles for transitioning Seychelles into a knowledge-based and innovation-driven economy in the next ten years – 2016 to 2025.

The policy is structured to address and strengthen the four key pillars of a Knowledge-Based Economy which includes, Economic Incentive & Policy Regime, Creating a Knowledge Society, Evolving a National Innovation System (NIS), and Building a Modern Information Infrastructure.

The policy objectives selected to address the gaps identified in research, technology and innovation management in Seychelles, include Leadership, STI in Socio-Economic Transformation, Human Capital Development, evolving the National Innovation System, Capacity Building, STI Data Management System, Information Infrastructure, Governance and Efficient Implementation, Monitoring and Evaluation.

Introduction

The National Institute for Science Technology & Innovation (NISTI) was enacted in 2014 to harmonize the development of Science, Technology and Innovation (STI) across all sectors and programmes. At this juncture, NISTI is aware of Seychelles need to transit from an efficiency-driven economy to an innovation-driven knowledge-based economy through the inclusion and integration of STI into the Strategic Development Plan 2018 – 2022. This strategic plan is based on the National STI Policy and Strategy 2016 – 2025. It is the framework for inclusion and integration of STI across all sectors and programmes for our socio-economic transformation to enhance and sustain our competitive advantage as a Small Island Developing State. It is however, important to note that the successful implementation of this plan depends greatly on other stakeholders due cross-sectorial nature of STI. The key components of the strategic plan are reflected in the National STI Integrated Governance system as shown in Annex 3.

Alignment with broader national context

The STI Policy and Strategy Plan (2016-2025) set the direction for achieving the national priority goals for the transition to KBE, while keeping focus on the UN Sustainable Development Goals (SDGs). The successful implementation of the policy and strategy largely depends on the systematic development of a national STI integrated governance system, which is detailed in Annex 3. None of the UN SDGs can be achieved without the support of STI, which means that NISTI's Strategic Plan directly and indirectly relates to the SDGs. It will fundamentally contribute to the achievement of SDG 4, 7, 9, 13, 14, 15 and 17, particularly SDG 9, 14 and 17.

Purpose of the strategic plan

NISTI's Strategic Plan 2018 – 2022 is to support the implementation of the National STI Policy & Strategy 2016 – 2025. This will serve as a strategic framework for Seychelles transition from an efficiency-driven economy to an innovation-driven knowledge-based economy by 2025, as well as achieving the UN SDGs by 2022. While keeping the plan in alignment with the PPBB and PM&E, NISTI has identified areas of new spending over the next three years i.e. 2019 – 2021.

This is important to NISTI as a facilitator for the inclusion and integration of STI across all sectors and programs during the transition to a KBE.

Methodology for the development of the strategic plan

The approach to the development of the strategic plan was to look at the strategic milestones in the National Policy and Strategy 2016 – 2025 and identify the national strategic priorities. Those priorities were then allocated to the programmes and sub-programmes of NISTI’s budget structure.

Foundational sector analysis

The development of STI in Seychelles has been very fragmented and dispersed across different organizations without a clear strategic direction. The political, economic, social, technological, legal and environmental (P.E.S.T.L.E) analysis provided the basis for our SWOT analysis below. It was important to have the P.E.S.T.L.E analysis due to the cross-sectorial nature of STI.

Table No 1

SWOT Analysis

<p style="text-align: center;">STRENGTHS</p>	<p style="text-align: center;">OPPORTUNITIES</p>
<ul style="list-style-type: none"> ▪ Availability of supporting physical infrastructure; ▪ Good Science Technology and Innovation policy and strategy framework; ▪ Good ICT infrastructure (hardware); ▪ Clear legal mandates, roles and functions; ▪ Competent and professional available workforce; ▪ Good working relationship and teamwork; ▪ Well-establish local, regional and international networks and collaboration; and ▪ Leadership driven by passion and commitment. 	<ul style="list-style-type: none"> • Weak National Innovation System; • Low access to credible and public information; • Absence of open data access system at national level; • Absence of Tech transfer system and a national system to coordinate tech transfer ▪ Inadequate IP framework to support technology and innovation • No Research & Development coordinating framework; • Ratified SADC STI Protocol; • Absence of baseline data to determine GERD as % of GDP; • Overall system poorly support the ease of doing business; • Presence of some emerging indigenous technologies; • Absence of knowledge transfer between industries and universities; and ▪ Physical location in the most affluent region of the country.

WEAKNESSES	THREATS
<ul style="list-style-type: none"> • Short of human resources to implement strategies and objectives and deliver quality services; • Reluctance to make use of social media due to a culture of keeping to oneself; • Insufficient implementation of administrative structure in planning and organization; • Insufficient integration of technology and innovation in day-to-day working of organization; • Unreliable Wi-Fi Internet connectivity; • High-skilled labor force not available locally; • Turnover of the staff in the R&D section; • Absence of own scheme of service to attract cadres; • Lack of formal health and safety regulations and procedures in workplace; • Insufficient transportation facility for staff movement; • Poor Research & Development capabilities; and • No formal funding for Research & Development and Innovation. 	<ul style="list-style-type: none"> • Inconsistency and focus of government to the advancement of the organization; • Keeping NISTI at arm-length attitude of key stakeholders; • Insufficient budgetary support; and • Low level of appreciation of STI across all spectrum of society.

Vision and mission

Vision

To be the leading institution that harnesses the strength of Science, Technology and Innovation to transform Seychelles into a knowledge-driven, innovative and prosperous Small Island Developing State.

Mission

Embed STI into the national socio-economic transformation to spur knowledge-driven and value-added sustainable growth and development for improving the quality of life of our people.

Core Values



Figure No: 1 Core Values

- **Team spirit:** We believe in working together as a team for the success of the organization.
- **Creativity and Innovation-driven:** We promote creative thinking and innovative ideas to solve common everyday problems and in finding ways to adopt these for the betterment of all.
- **Self-determination:** We promote self-engagement, commitment, self-efficiency and determination to enhance learning and development of self.
- **Passion and drive towards Research and Development (R&D):** We believe in passion for science, research and development to create and share knowledge
- **Competency-driven:** We believe in having the drive to continuously improve knowledge and skills to meet new challenges.
- **Urge for Evidence-Based Practices:** We strongly advocate use of evidence-based information and promote evidence-based practise in research and development.
- **Pro-activity:** We encourage critical and forward thinking to take leadership and initiatives.
- **Technology savvy:** We encourage one to be proficient in the ways of the use of modern technologies and using them to facilitate process in workplace setting
- **Spirit of collaboration:** We strongly encourage the sharing of knowledge and experience within and outside the organization and to have the willingness to learn from others.
- **Regional and International Focus:** We focus on regional and international collaboration by keeping abreast of the global trends in sustainable development

Table No 2: Strategic objectives

Transform Seychelles into a knowledge-based and innovation-driven economy that will attain its *national* as well as the *United Nations' Sustainable Development Goals* by 2030 through the inclusion of STI across all sectors and programmes.

Strategic Objectives	Impact	Key Outcomes	Core Activities	Indicative Costs
1. Ensure the inclusion and integration of STI across all sectors and programmes to foster socio-economic growth and development.	Enhancement of the development of STI across sectors and programmes to improve sector performance	<ul style="list-style-type: none"> Improved productivity and efficiency throughout organization Improved organizational performance to boost socio-economic growth 	<ul style="list-style-type: none"> Establish linkages through formal STI liaison at the level of MDAs Establish reporting mechanism to monitor MDAs STI agenda Create feedback loops/NISTI and MDAs STI activities. 	<ul style="list-style-type: none"> SCR 150, 000.00/year SCR 50,000.00/year SCR 20,000.00/year
2. Establish a baseline for GERD to determine % of GDP	Seychelles has an established baseline for GERD	<ul style="list-style-type: none"> R&D and STI sectors can get proper funding for investment and development Seychelles can be benchmarked with other countries Government can better identify gaps for funding in the R&D STI sector 	<ul style="list-style-type: none"> Set baseline for GERD % of GDP from 2016-2017 R&D survey Making use of baseline to bring awareness to increase spending in R&D Monitor increase of GERD % of GDP through biennial R&D and Innovation survey (2019-2020) 	SCR 450,000.00

<p>3. Facilitate the development of a National Innovation System</p>	<p>A more conducive environment for innovation to thrive</p>	<ul style="list-style-type: none"> • Better linkages and interfaces of national innovation system; and • Enhanced level of innovation across all sectors and programmes 	<ul style="list-style-type: none"> • Situational analysis of NIS system • Follow up with UNIDO on support on measuring and mapping NIS • Develop strategy to strengthen NIS • Assess progress of NIS through World Bank Knowledge Assessment Methodology (KAM) • Establish a National Innovation Incentive Scheme (Award) 	<ul style="list-style-type: none"> • SCR 25,000.00 • SCR 25,000.00 • SCR 50,000.00 • SCR 25,000.00
<p>4. Setting up the National Technology Transfer System</p>	<ul style="list-style-type: none"> • Create the condition to commercialize research. • Co-ordination of technology transfer. 	<ul style="list-style-type: none"> • Increase in commercialized products through research and IP. • Enhance the adoption and absorption of new technologies 	<ul style="list-style-type: none"> • Set up technology transfer system with key stakeholders • Work in collaboration with BTI to support start-ups. • Coordinate and monitor technology transfer 	<ul style="list-style-type: none"> • SCR 150,000.00 • SCR 50,000.00 • SCR 250,000.00

<p>5. To set-up a national open-access data management system</p>	<p>A user-friendly open access data management application that is accessible to everyone</p>	<ul style="list-style-type: none"> • User-friendly public data sharing platform. • To have readily available data for evidence-based decision making and policy formulation 	<ul style="list-style-type: none"> • Audit of all metadata sets at national level • Establish linkages with metadata centers • Develop sharing mechanism with metadata centers • Develop data sharing platform 	<ul style="list-style-type: none"> • SCR 50,000.00 • SCR 150,000.00 • SCR 300,000/year • SCR 300,000.00 annual licensing fees
<p>6. Develop strategic collaboration and linkages with national, regional and international organizations</p>	<p>Enhanced national STI capacity</p>	<ul style="list-style-type: none"> • Better access to funding for research and development • Benefit from knowledge-sharing • Enhancement of a national competitive advantage 	<ul style="list-style-type: none"> • Making use of the integrated STI governance system to develop and sustain linkages • Develop regional and international collaboration through MoF and networks • Monitor and evaluation of collaboration. 	<ul style="list-style-type: none"> • SCR 300,000.00/year
<p>7. Facilitate the development a Business, Technology and Innovation Incubator (BTI) with stakeholder's collaboration</p>	<p>Promotion of Innovation and entrepreneurship to improve the national economy</p>	<ul style="list-style-type: none"> • To improve the environment for innovation to thrive • To enhance the level of entrepreneurship • Enhance the probability for successful commercialize products and services 	<ul style="list-style-type: none"> • Prepare Cabinet proposal for development of BTI • Seek approval from Cabinet on BTI project • Develop phase 1 of BTI project • Develop phase 2 of BTI project • Provide infrastructure 	<ul style="list-style-type: none"> • - • - • SCR 2,409,750.00 • SCR 638,687.00 • SCR 3,000,000.00

<p>8. To setup the co-working space through oasis concept (Interfacing the oasis with the BTI).</p>	<ul style="list-style-type: none"> • Attract new talents, knowledge and skills to create global networks to solve local problems through the development of an innovation and entrepreneurship culture. • Establishment of new start-ups companies and creates new investment opportunities. • Help to reverse brain drain and expose local academics to develop an early global culture 	<ul style="list-style-type: none"> • Provide a conducive environment for innovation and entrepreneurship to thrive. • Sustainable economic growth and diversification. • Enhance the knowledge-based competencies through global exposure. 	<ul style="list-style-type: none"> • Integrate the Oasis in the BTI 	<ul style="list-style-type: none"> • SCR 120,000.00 • SCR 750,000.00 • SCR 500,000.00
<p>9. Setting up of the National Research Foundation</p>	<p>Enhance the capacity for R&D</p>	<ul style="list-style-type: none"> • A funding mechanism for R&D • A funding mechanism for publication • System for peer-review of research work 	<ul style="list-style-type: none"> • Develop TOR for NRF in collaboration with key stakeholders • Set up NRF • Prepare operational budget for R&D and publication • Outsource funding through Research Africa platform 	<ul style="list-style-type: none"> • SCR 50,000.00 • SCR 100,000.00 • Budget based on projection of 1% GDP by 2020 • SCR 64,000.00/year for subscription fees.
<p>10. Set up a STEM education system in collaboration with key stakeholders to provide the necessary knowledge and skills to drive innovation and entrepreneurship</p>	<p>Improved the level of STEM-related knowledge and skills throughout the educational system.</p>	<ul style="list-style-type: none"> • A rekindle of interest and motivation in STEM education • Improvement on overall performance in STEM-related disciplines across all level of education. • Better industry-preparedness in STEM-related trades. 	<ul style="list-style-type: none"> • Establish strong working relationship with the Ministry of Education and Human Resource Development and other stakeholders to develop a national STEM education system • Set up STI clubs at all level of educational system, starting at secondary level 	<ul style="list-style-type: none"> • SCR 10,000.00 • SCR 25,000.00 • SCR 50,000.00/year

Strategic Choices: Overview of Sector policies, programmes and projects

The strategic choices are made in alignment with the implementation of National STI Policy and Strategy 2016 – 2025. Those choices include both *policy measures* and *institutional arrangements* for promoting *STEM I&E Education*:

- establishing a *National Research Foundation* (NRF) to provide criteria for prioritization and funding for research and publications
- a *National Research Data Centre* to act as a data repository for all research outcomes as well as databank for the *STI Knowledge Hub*
- a *Business, Technology and Innovation Incubation (BTI) System* to provide assistance to SMEs and individual entrepreneurs,
- a National Innovation System (NIS), and, putting in place a Technology Transfer (TT) system.
- an *Integrated STI Governance System* for establishing linkages between key stakeholders of STI at the strategic, operational and functional levels. Refer to Annex 3.

2016-2020	2020 -2025
<ul style="list-style-type: none"> ✓ STI Survey on R&D and Innovation ✓ Establish Linkages for STI Governance ✓ Establish Business, Technology & Innovation Incubator ✓ Establish Research Data Center ✓ Establish National Research Foundation ✓ Evolve National Research & Infrastructure Plan ✓ Establish STEM & IE Committee ✓ Establish Linkages of NIS ✓ Build GERD up to 1% OF GDP by 2020 	<ul style="list-style-type: none"> ✓ Integrate National Innovation System ✓ Establish Long Term National Research Plan ✓ Complete data Curation & Preservation & Link RDC to UN Technology Facilitation Mechanism ✓ Establish Science Center ✓ Establish Regional Centre of Excellence in Blue Economy Research ✓ Build GERD up to 2 % by 2025

Table No 3. Strategic Objectives to support the transition from an efficiency-driven to an innovation-driven knowledge-base economy

Table 4: New spending proposals to support strategic priorities

Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2:SCIENCE, TECHNOLOGY, INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	To facilitate the development of the National Innovation System (NIS)	NISTI need to develop linkages with different national and international stakeholders to enhance the National Innovation System.	PSIP	-	-	-
			Compensation of Employees	-	-	-
			Goods and Services	50.00	75.00	75.00
			Minor Capital Outlays	25.00	50.00	50.00
			Total	75.00	125.00	125.00
Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2 SCIENCE , TECHNOLOGY AND INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	To set up the Business Technology and Innovation (BTI) incubator	NISTI is going to set up the BTI and it will need capital investment for the renovation of the building and purchase of IT equipment and furniture for the facility as well as compensate manpower manning the facility	PSIP	3,000.00	-	-
			Compensation of Employees	510.00	510.00	552.50
			Goods and Services	3,000.00	200.00	200.00
			Minor Capital Outlays	750.00	1400.00	2800.00
			Total	7,260.00	2110.00	3552.50
Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2 SCIENCE , TECHNOLOGY AND INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	To establish a governing body for Research and Development	NISTI will need funding to set the National body that coordinates Research and Development	PSIP	-	-	-
			Compensation of Employees	-	-	-
			Goods and Services	200.00	200.00	200.00
			Minor Capital Outlays	25.00	50.00	50.00
			Total	225.00	250.00	250.00
Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2 SCIENCE , TECHNOLOGY AND INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	To set up a knowledge Management Platform	NISTI will set up an information management system that will link all different metadata platforms through an Application Program Interface (API). The system will allow the sharing of data between	PSIP	-	-	-
			Compensation of Employees	260.00	260.00	281.66
			Goods and Services	1164.00	600.00	600.00
			Minor Capital Outlays	27.00	50.00	50.00
			Total	1451.00	910.00	931.66

		different sectors				
Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2 SCIENCE , TECHNOLOGY AND INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	To setup the co-working space through oasis concept (Interfacing the oasis with the BTI).	NISTI will set up the oasis concept to attract new startup companies to solve local problems through the development of an innovation and entrepreneurship culture	PSIP			
			Compensation of Employees	260.00	260.00	281.66
			Goods and Services	115.00	115.00	115.00
			Minor Capital Outlays	25.00	50.00	50.00
			Total	400.00	425.00	446.66
Programme	Priority Objective	Description and motivation	R'000s	Cost 2019	Cost 2020	Cost 2021
P2 SCIENCE , TECHNOLOGY AND INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	Setting up the National Technology Transfer System	NISTI is going to set up the National Technology transfer System to enhance and coordinate the adoption and absorption of technologies.	PSIP	-	-	-
			Compensation of Employees	260.00	260.00	260.00
			Goods and Services	200.00	300.00	300.00
			Minor Capital Outlays	50.00	50.00	50.00
			Total	510.00	610.00	610.00

NISTI's Structure and Function

The National Institute for Science, Technology and Innovation (NISTI) is an autonomous body under the Office of the Vice President. The mandate of NISTI is to ensure the inclusion of STI across all sectors and programmes through the implementation of a national policy and strategic framework.

Figure 2 on page 15 shows NISTI's organizational structure. The organogram shows the current status of NISTI's operation (in blue) and the projected positions to fully implement the strategic plan (in green).

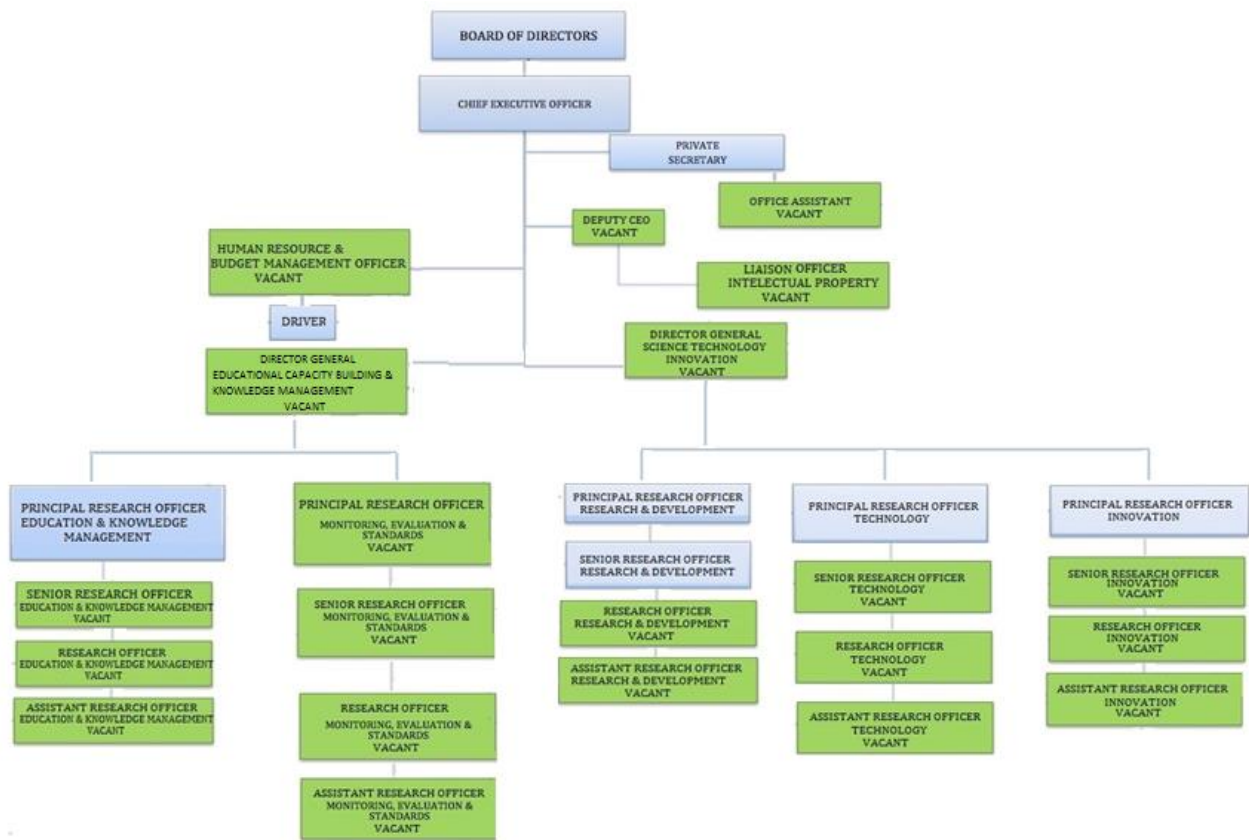


Figure 2: NISTI's Organizational Structure

Below is a brief summary of the structure and function of each of these sectors. Under the CEO's office portfolio are the sections of Human Resources and Administration the Office of Intellectual Property both positions are currently vacant. NISTI's two directorates are the Directorate of Education Capacity building and Knowledge Management and the Directorate of STI Programmes.

The Directorate of Education Capacity building and Knowledge Management is made up of the following sections:

1. STI Capacity Development, Education & Awareness

This Section has the following responsibilities:

- Assessment of all NISTI's capacity needs in term of human resources in line with the Department of Human Resources for the development of STI;
- Assessment of all NISTI's infrastructural needs in liaison with all the other sections;
- Assist in the development of science education with liaison with the Ministry of Education and other partners;
- Raise awareness on science, technology and innovation activities
- Partner with the Ministry of Education to promote STEM Education
- Seek to procure travel grants and other training benefits for local scientists to attend scientific meetings and short-term training courses.
- Promote local, regional and international collaboration and partnerships
- Promote and encourage private sector involvement in scientific and technological research, innovation and development; and
- Create and promote a conducive environment for innovation in order to increase sustainable economic growth

2. Knowledge Management

- Create and administer a centralized national database system of all scientific research and activities;
- Share and disseminate scientific knowledge at national level as well as regional and international level;
- Ensure that all sectors of the economy have access to scientific documentation; and
- Encourage and promote the sharing of scientific knowledge to support the development and growth of STI.
- Ensure compliance and consistency of NISTI's Standard Operating Practices or Procedures (SOPs);
- Annually, review the progress in scientific research systems and submit a report of its findings and recommendations to Cabinet;
- Quarterly report to the Institute's Board on the progress of the NISTI's activities.
- Undertake, regular inspections, monitoring and evaluation, as appropriate, activities relating to scientific research and technology development and innovation, and of research institutions to ensure compliance with set standards and guidelines; and
- Develop and enforce codes, guidelines and regulations in accordance with government's STI policy for the governance, information management and maintenance of standards and quality when undertaking research.

The Directorate of STI Programs has the following sections: Research and Development, Technology Development and Innovation, which are currently being manned by their respective Principal Research officers with the exception to the R&D section that has a Senior Research Officer as well.

3. Research and Development

- Coordinate, at national level, activities relating to scientific research and development;
- Improve the spectrum for research by providing an enabling environment and resources for a Centre of Excellence in bio-technology to make the maximum use of the rich bio-diversity that the country possesses;
- Regulate research activities and national level;

- Evaluate and approve research proposals;
- Develop understandings amongst national research bodies as well as regional and international organizations;
- Ensure that all research carried out on the national soil benefits the national interests;
- Collaborate with other research centers and facilities at regional and international level; and
- Ensure that applied research leads to commercialization of findings.

4. Technology Development

- Coordinate, at national level activities relating to technological development;
- Ensure that the right technologies are transferred, adapted and adopted to minimize socio-economic losses;
- Partake in the development in homegrown technologies;
- Ensure that research findings that need transferred technologies for commercialization purposes are made available; and
- Continually monitor the development in the field of technology that is relevant to the context the national context.

5. Innovation

- Work in collaboration with and lead inter-governmental efforts to implement sound programs, projects and budgets that support innovation;
- Coordinate, at national level, activities relating to scientific research and innovation;
- Improve the spectrum for research by providing for an enabling environment and resources for a Centre of Excellence for the youth to explore innovative ideas in science for promoting and rewarding excellence, and innovation;
- Provide an environment where creative and innovative ideas can incubate and commercialized;
- Create and administer of centres of excellence in STI and technology parks in strategic STI areas; and
- Promote adoption, dissemination and diffusion of technologies amongst enterprises

Budget

Current expenditure trends

Consolidated Expenditure Estimates

Table No 5: Consolidated expenditure estimates

SR'000s	2016 Estimated Actual	2017		2018 Budget	2019 Forecast	2020 Forecast
		Budget	Revised Budget			
Programmes						
P1: GOVERNANCE, MANAGEMENT & ADMINISTRATION	4,577.78	2,667.77	2,741.91	2,519.80	2,700.10	2,702.91
P2: SCIENCE, TECHNOLOGY, INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	1,730.11	2,184.36	2,098.93	2,330.41	2,498.73	2,539.15
Programme Total	6,307.90	4,852.13	4,840.84	4,850.21	5,198.83	5,242.06
Economic Classification						
CURRENT EXPENDITURE	4,189.96	4,852.13	4,840.84	4,850.21	5,198.83	5,242.06
Compensation of Employees	1,237.62	1,860.64	1,849.35	1,859.22	2,177.92	2,187.92
Wages and Salaries in Cash	1,237.62	1,860.64	1,849.35	1,859.22	2,177.92	2,187.92
Wages and Salaries in Kind	10.00	-	90.00	120.00	120.00	120.00
Use of Goods and Services	2,952.35	2,991.49	2,991.49	2,991.00	3,020.91	3,054.14
Office expenses	485.23	467.17	467.17	743.10	747.25	764.73
Transportation and Travel cost	458.39	341.50	411.62	289.02	294.99	305.22
Maintenance and Repairs	147.70	144.50	144.50	78.85	78.85	79.18
Materials and Supplies	3.61	3.00	3.00	3.18	3.18	3.38
Other uses of Goods & Services	1,847.42	1,379.32	1,219.21	1,595.84	1,583.63	1,589.63
Minor Capital Outlays		656.00	656.00	161.00	193.00	192.00

CAPITAL EXPENDITURE	2,117.93	-	-	-	-	-
Non-financial assets	2,117.93	-	-	-	-	-
<i>Building and infrastructure</i>	2,117.93	-	-	-	-	-
<i>Machinery and Equipment</i>	-	-	-	-	-	-
<i>Other Fixed Assets</i>	-	-	-	-	-	-
<i>Non-produced Assets</i>	-	-	-	-	-	-
Total	6,307.90	4,852.13	4,840.84	4,850.21	5,198.83	5,242.06

Table No 6: Staffing Budget

Consolidated Position	2018	2019	2020	2021
SR'000s	Compensation of employees	Compensation of employees	Compensation of employees	Compensation of employees
P1: GOVERNANCE, MANAGEMENT & ADMINISTRATION	390.56	705.23	705.23	724.83
P2: SCIENCE, TECHNOLOGY, INNOVATION CAPACITY BUILDING AND KNOWLEDGE DISSEMINATION	1,468.65	3,008.00	3,108.00	3,194.47
Total	1,859.22	3,713.23	3,813.23	3,919.3

Table No: 7 Performance Monitoring and Evaluation

Key challenges	Strategic objective	Indicator	Baseline (2017)	Target					Monitoring responsibility	Data source	Indicator protocol ¹
				18	19	20	21	22			
1 Lack of integration of STI across sectors and programmes.	Integrate STI across sectors and programmes in transition to a knowledge-based economy	Outcome: Number of MDAs implementing STI Strategic Plans	1	2	4	6	-	-	NISTI and MDAs	MDAs	Annex 2
		Output: Number of MDAs with STI Strategic Plans	1	4	8	12	-	-	NISTI	NISTI	Annex 2
2 Lack of credible data to monitor government expenditure in R&D.	Establish a baseline for GERD to determine % of GDP	Outcome: % Increase of GERD	0.125	0.25	0.375	0.5	-	-	NISTI	MDAs, private sector and NGOSs	Annex 2
		Output: GERD as % of GDP	0.4	0.6	0.8	1.0	-	-	NISTI, NBS, EMIS, UIS, NEPAD/ASTII	MDAs, Private Sector and NGOs,	Annex 2
3 Absence of national STI data management system	To set-up a national open-access data management system.	Outcome: Number of user queries	0	100	200	300	-	-	NISTI	MDAs, private sector and NGOSs	Annex 2
		Output: Number of MDAs with updated data management system in place	5	7	9	11	-	-	NISTI, DICT & MDAs	MDAs	Annex 2
		Output: Number of MDAs linked in the data management system	0	2	4	6	-	-	NISTI		
4. A very dispersed and	Facilitate the development of a	Outcome: Improve annual Innovation Pillar score based on	0	0.5	0.5	0.5	-	-	NISTI, DICT, MoE & HRD,	MDAs, private sector and	Annex 1

weak National Innovation System	National Innovation System	World Bank KAM							MoFT & EP	NGOSs	
		Output: Improve the ranking of the National Knowledge Economic Index (KEI)	7	7.5	8.0	8.5			NISTI, DICT, MoE & HRD, MoFT & EP	MDAs, private sector and NGOss	Annex 1
5. Absence of Technology Transfer system at national level to support researches to commercialization	Setting up the National Technology Transfer system	Outcome: Increase number of successful technology absorbed and adopted	0	5	10	15			NISTI, IP office, UNISEY	IP office	Annex 2
		Outputs: (1) Number of Startups (2) Number of Patents and licenses	0 0	5 0	10 0	15 2			NISTI, IP office, UNISEY	IP office	Annex 2
6. Demographic and financial constraints to build national capacity in STI.	Develop strategic collaboration and linkages with national, regional and international organizations to strengthen national capacity in STI.	Outcome: Number of active joint programmes in STI	National (2)	4	6	8			NISTI	MDAs, Private Sector, NGOs	Annex 2
			Regional (2)	4	6	8		Regional Organizations			
			International (1)	2	4	6		International Organizations			
		Output: Number of bi-lateral collaborations	National (4)	6	8	10			NISTI	MDAs, Private Sector, NGOs	Annex 2
Regional (3)	5	7	9			NISTI	Regional Organizations				
International (2)	4	6	8			NISTI	International Organizations				
7. Absence of incubation facilities to support	Facilitate the development a Business, Technology and	Outcomes: (1) Increase in number of start-ups attaining incubation phase	(0)	3	6	9			NISTI	NISTI, MIEDBI, Unisey, Guy Morel	Annex 2
		(2) Increase in number of	(0)	3	6	9			NISTI		

innovation	Innovation Incubator (BTI) with stakeholder's collaboration	incubatees reaching commercialization phase (3) Increase in number of successful commercialized ventures	(0)	1	2	3			NISTI	Institute, SCCI & SenPA	
		Output: Number of start-ups		5	10	15			NISTI	SCCI, SRC, NBS, MIEDBI and Licensing Authority	
8. Absence of institutional framework for R&D at national level	Setting up of the National Research Foundation	Outcome: (1) Increase in peer-reviewed research proposals	(0)	2	4	6			NRF/NISTI	MDAs, NGOs and Civil Society	Annex 2
		Output: Number of government funded R&D	(3)	4	5	6			NISTI	MDAs, NGOs and Civil Society	Annex 2
9. Limited social capital and knowledge capacity for economic diversification	Widening the knowledge base and international relation through the Oasis concept	Outcome: Sustainable economic growth and diversification									
		Output: 1. Number of start-ups	0	2	4	6			NISTI	NISTI, MIEDBI, SIB, SLA, Oasis Platform	Annex 2
		2. Number of global partners	0	10	15	20					
10. Absence of a national STEM education system	Set up a STEM education system in collaboration with key stakeholders to provide the necessary knowledge and skills to drive innovation and entrepreneurship	Outcome: Number of active STEM-based programmes in schools	(3)	4	5	6			NISTI, MoE & HRD, Unisey	MoE & HRD	Annex 2
		Output: Number of institutions with new STEM-based initiatives	(0)	2	4	6			NISTI, MoE & HRD	MoE & HRD	Annex 2

Descriptions for the core indicators

1. **Number of MDAs with STI strategic plans:** Counting the number of MDAs that have developed and implementing STI policies and strategies at sector level.
2. **GERD as % of GDP:** Gross expenditure in R&D as percentage of GDP
3. **Number of MDAs with updated data management system:** Counting the number of MDAs that are presently having a website with updated information
4. **Number of MDAs linked in the data management system:** Counting the number of MDAs with a website that can be access through NISTI's data management platform
5. **Improve the ranking of the National Knowledge Economic Index (KEI):** Improve the overall preparedness of the country for knowledge-based economy
6. **Number of bi-lateral collaborations:** The number of national, regional and international collaborations formed with NISTI
7. **Number of start-ups:** The number of new ventures started locally and internationally through NISTI's Business Technology Incubator (BTI) and Oasis
8. **Number of successful technology absorbed and adopted:** The number of technologies that have been transferred and are being successfully adapted and adopted
9. **Number of patents and licenses:** The number of patents and licenses registered based on research finding.
10. **Number of government funded Research & Development:** Number of research carried out with government funds
11. **Number of global partners:** Number of individuals or organisations that are engaged in the global co-working space
12. **Number of institutions with new STEM-based initiatives:** Number of Educational institutions that have defined and established new STEM-based programmes

Change management

For the successful implementation of the National Policy and Strategy 2016 – 2025, NISTI has designed an integrated STI governance system. This system will integrate key stakeholders at strategic, operational and functional level. Please refer to Figure 3 below. This is important for the governance of STI in order to minimize the risks associated with silo operations.

The Integrated STI Governance System is central to the transformative approach for the growth and development of STI in support of Seychelles’ transition from efficiency-driven economy to an innovation-driven knowledge-based economy by 2025.

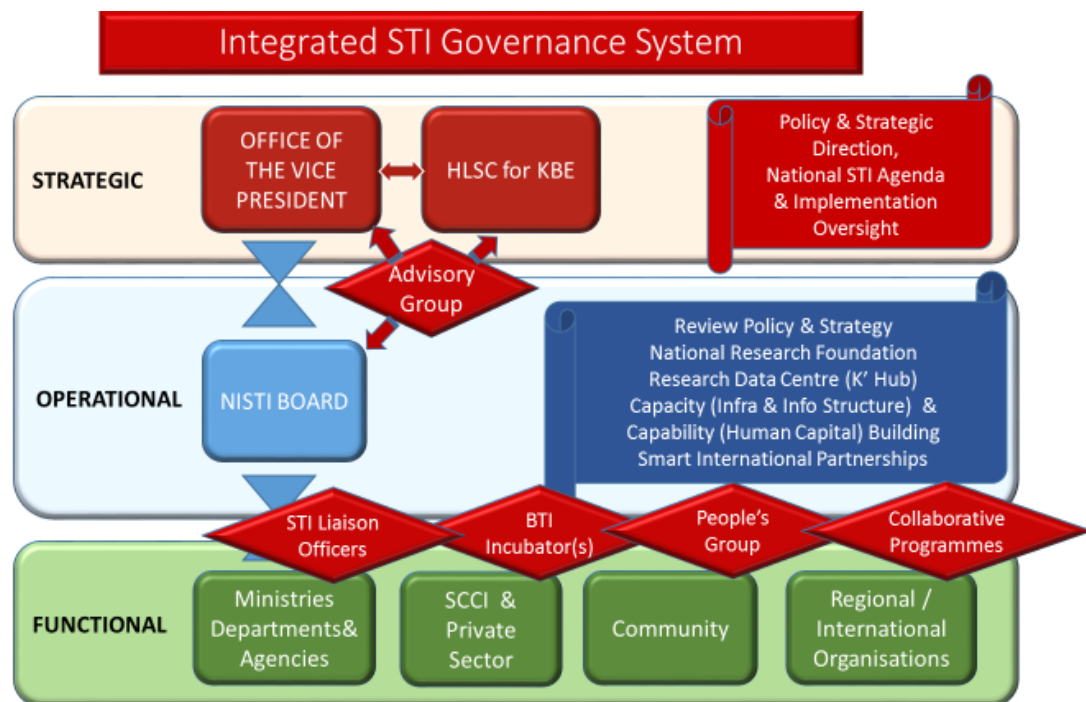


Figure 3: Integrated STI Governance System

The key components of the Change Management system are; the setting up of a National Research Foundation (NRF), establishment of a Knowledge Hub and a Business, Technology and Innovation Incubator (BTI). Refer to Annex 3.

1. The NRF will be responsible for peer-review of research proposals and findings, research funding, publications and dissemination.
2. The Knowledge Hub will be responsible to centralized all scientific data and

information and provided access to all through a web portal.

3. The setting up of BTI that will support ideation, incubation and commercialization.
4. Collaboration with the Ministry of Education and Human Resources Development and other stakeholders, particularly community-based organizations for the development of a national STEM education system.

Key Stakeholders

NISTI's key stakeholders for the successful implementation of its strategic plan are all government ministries and agencies, the private sector, NGOs, civil societies and community-based organizations. This is due to the cross-sectorial nature of STI, which reflects the broad mandates of NISTI.

Communication Strategy

For the successful implementation of the strategic plan, there is a need of establishment of linkages across all sectors and programmes through an advisory body between the strategic level and operational level and liaisons between the operational and functional level of the Integrated STI Governance System, as shown in Figure 3.

Risk Management

The potential risks to this plan are:

1. The existing culture of organizations operating in silos.
2. The lack of understanding of STI Policy and Strategy 2016 – 2025 due to the poor policy and strategy literacy culture.
3. The limited e-government structure and effectiveness
4. The lack of policy coherence across sectors and programs in support of STI.
5. The insufficient budgetary support for STI.
6. The insufficient political support for budget from the legislative arm of the government especially from the majority party.
7. The difficulty of raising funds to support the plan.
8. Inadequate infrastructure and human capital.

9. The lack of resources to support regional and international collaboration.
10. Time constraints in relation to the period set for the transition to a knowledge-based economy by 2025.

In order to mitigate the above risks, the following actions need to be taken:

1. Establish linkages with all MDAs and other stakeholders through liaison personnel.
2. Continuous promotion of the STI Policy and Strategy 2016– 2025 through meetings, workshops and other communication means.
3. Work in collaboration with DICT and other partners to improve the e-government capacity.
4. Carryout an audit to identify the gaps in policy coherence in support of STI and work across sectors to bridge the gaps.
5. Ensure NISTI's priorities and milestones are clearly conveyed to the leadership.
6. Bring awareness of the importance of STI to the legislative arm of the government.
7. Prepare project proposal to attract foreign funding.
8. Continuous capacity-building in STI and STEM-related disciplines.
9. Work in close collaboration with the Ministry of Finance, Trade and Economic Planning to improve on the existing infrastructure at NISTI.
10. Foster close regional and international collaboration with counter-part institutions.
11. Ensure that the legal and regulatory framework are in place for the implementation of the policy and strategy
12. Keep a close monitoring and evaluation process of the implementation of the strategic plan.

Conclusion

NISTI's Strategic Plan 2018 – 2022 is a framework to implement the National STI Policy and Strategy 2016 – 2025 in support of Seychelles transition to KBE as well as providing support to the UN SDGs. The successful implementation of the plan depends greatly on cross-sectorial collaboration through linkages across MDAs. A number of the programs and projects in this plan would need Cabinet approval such as the establishment of the BTI, NRF as the legal and regulatory framework to support the full implementation of the plan. The most important determinants for the implementation of the plan are political support, budgetary support as well as a change in the culture of operating in silos.

As this plan is in support of a cross-sectorial policy and strategy, the sensitization and awareness of the policy shall be done through liaisons across MDAs as well as through workshops and forums.

Annexure

The annexes presents any key sector information the sector wishes to present, e.g. on a more detailed sector analysis, core sector activities, structure, budget, staffing, partnerships and documentation on the consultation and validation process.

Annex 1

Variable	Value	Notes	Normalized Score
Annual GDP Growth Rate	5.12	Averaged the annual growth rate from 2005-2009 using data from WDI; compared this with annual average growth rates of 145 countries. 49 countries performed better than the Seychelles. Computed normalized score	6.62
Tariff & Non- Tariff Barriers	56.2	Took the 2014 rate given to us by the Seychelles. The Heritage Foundation suggested a 33.4 rate. Compared this with rates for 144 countries; 141 performed better than Seychelles. Computed the normalized score.	0.21
Regulatory Quality	-0.29	Used the 2013 rate from the World Governance Indicators. Compared this with rates for 147 countries; 95 performed better than the Seychelles. Computed the normalized score.	3.54
Rule of Law	0.04	Used the 2013 rate from the World Governance Indicators. Compared this with rates for 147 countries; 62 performed better than the Seychelles. Computed the normalized score.	5.78
Economic Incentive Regime Pillar (1)			3.18
S&E Journal Articles / Mil. People, 2007	43	Took the 2009 rate given to us by the Seychelles. Compared this with rates for 146 countries; 60 performed better than Seychelles. Computed the normalized score.	5.89
Royalty Payments and receipts(US\$/pop.)	35.346	Took the 2012 rate given to us by the Seychelles. Compared this with rates for 126 countries; 42 performed better than Seychelles. Computed the normalized score.	6.67
Patents Granted by USPTO/Mil People Avg. 2003-2007	50	Took the 2005-2013 number given to us by the Seychelles. Compared this with rates for 147 countries; 22 performed better than Seychelles. Computed the normalized score.	8.5
Innovation Pillar (2)			7.02
Average Years of Schooling, 2010	7.83	Took the 2013 rate given to us by the Seychelles. Compared this with rates for 128 countries; 81 performed better than Seychelles. Computed the normalized score	3.67
Gross Secondary Enrollment rate, 2009	99.9	Took the 2013 rate given to us by the Seychelles. Compared this with rates for 146 countries; 25 performed better than Seychelles. Computed the normalized score	8.29
Gross Tertiary Enrollment rate, 2009	3.35	Took the 2013 rate given to us by the Seychelles. Compared this with rates for 142 countries; 135 performed better than Seychelles. Computed the normalized score	0.49
Education Pillar (3)			4.15
Total Telephones per 1000 People, 2009	1753	Took the 2013 rate given to us by the Seychelles. Compared this with rates for 146 countries; 20 performed better than Seychelles. Computed the normalized score	8.63
Computers per 1000 People, 2008	378	Took the 2014 rate given to us by the Seychelles. Compared this with rates for 147 countries; 35 performed better than Seychelles. Computed the normalized score	7.62
Internet Users per 1000 People, 2009	470	Took the 2014 rate given to us by the Seychelles. Compared this with rates for 146 countries; 45 performed better than Seychelles. Computed the normalized score	6.92
ICT Pillar (4)			7.72
KEI		Knowledge Economy Index (1+2+3+4)	5.52
KI		Knowledge Index (2+3+4)	6.3

Figure 4: Basic KAM Score Card Of Seychelles (December 2014)

A KEI of 5.52 places Seychelles at 62 out of 147 countries

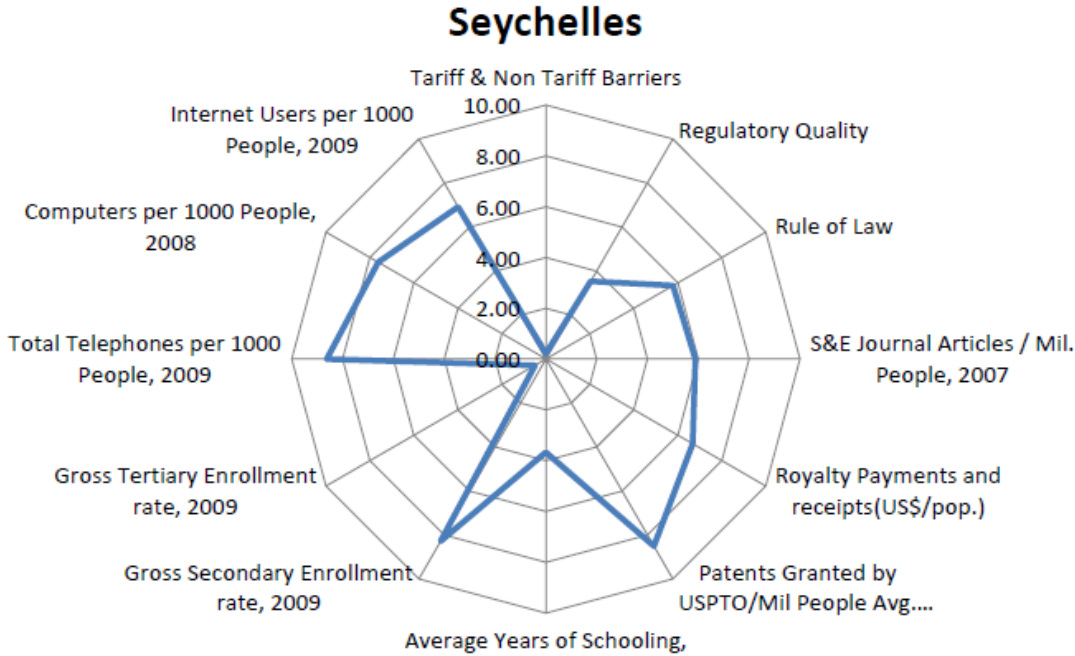


Figure 5: Basic Score Card of Seychelles Compared to all Other Countries

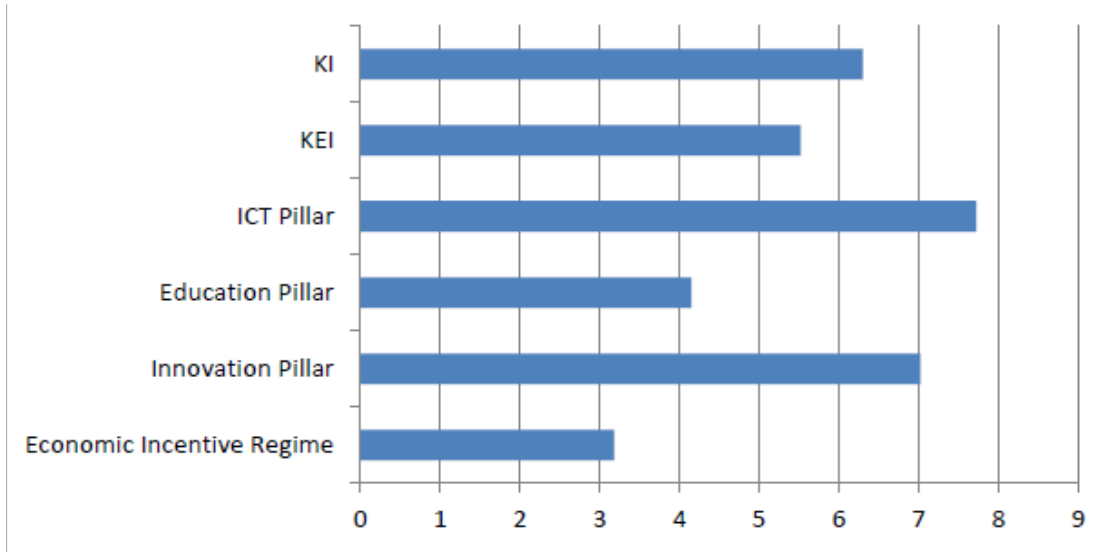


Figure 6: Comparative Scores Of The K4 Pillars

Annex 2

Table 8 showing the indicator protocols

Strategic objective	Indicator	Indicator Protocol
Integrate STI across sectors and programmes in transition to a knowledge-based economy	Outcome: Number of MDAs implementing STI Strategic Plans	
	Output: Number of MDAs with STI Strategic Plans	<ul style="list-style-type: none"> • Number of MDAs implementing STI strategic plans • Number of STI liaison officers in MDAs • Activity reports on STI Agenda of MDAs
Establish a baseline for GERD to determine % of GDP	Outcome: % Increase of GERD	
	Output: GERD as % of GDP	<ul style="list-style-type: none"> • Amount of money spent on Research and Development • Number of researchers in Seychelles
To set-up a national open-access data management system.	Outcome: Number of user of queries	
	Output: Number of MDAs linked in the data management system	<ul style="list-style-type: none"> • Number of users on the system • Number of queries in the search engine
Facilitate the development of a National Innovation System	Outcome: Improve annual Innovation Pillar score based on World Bank KAM	
	Output: Improve the Innovation Pillar Knowledge Economic Index (KEI)	<ul style="list-style-type: none"> • Number of successful innovators • Number of national innovation scheme • Number of collaboration and linkages
Setting up the National Technology Transfer System	Outcome: Increase number of successful technology absorbed and adopted	
	Outputs: (1) Number of Startups (2) Number of patents and licenses	<ul style="list-style-type: none"> • Number of successful startups. • Number of patents and licenses • Number of technologies are absorbed and adopted
Develop strategic collaboration and linkages with national, regional and	Outcome: Number of active joint programmes in STI	

international organizations to strengthen national capacity in STI.	Output: Number of bi-lateral collaborations	<ul style="list-style-type: none"> • Number of MoUs signed • Number of agreement between organizations. • Number of funds received from the National and International Organizations. • Amount of funds spent on STI
Facilitate the development a Business, Technology and Innovation Incubator (BTI) with stakeholder's collaboration	Outcomes: (1) increase in number of start-ups attaining incubation phase (2) Increase in number of incubates reaching commercialization phase (3) Increase in number of successful commercialized ventures	
	Output: Number of start-ups	<ul style="list-style-type: none"> • Number of registered start-ups • Number of Successful Commercialized products.
Setting up of the National Research Foundation	Outcome: (1) Increase in peer-reviewed research proposals	
	Output: Number of government funded R&D	<ul style="list-style-type: none"> • Number of research proposal received. • Number of peer-reviewed publications • Number of applied patents and copyrights • Collaboration between researchers from regional and international level
Set up a STEM education system in collaboration with key stakeholders to provide the necessary knowledge and skills to drive innovation and entrepreneurship	Outcome: Number of active STEM-based programmes in schools	
	Output: Number of institutions with new STEM-based initiatives	<ul style="list-style-type: none"> • Number of Science club activities on National level • Results in STEM related disciplines across all level of Education
Widening the knowledge base and international relation through the Oasis concept	Outcome: Sustainable economic growth and diversification	
	Outputs: 1. Number of start-ups 2. Number of global partners	<ul style="list-style-type: none"> • Number of registered start-ups • Number of participation from Seychelles diaspora • Number of participating global partners

Annux 3

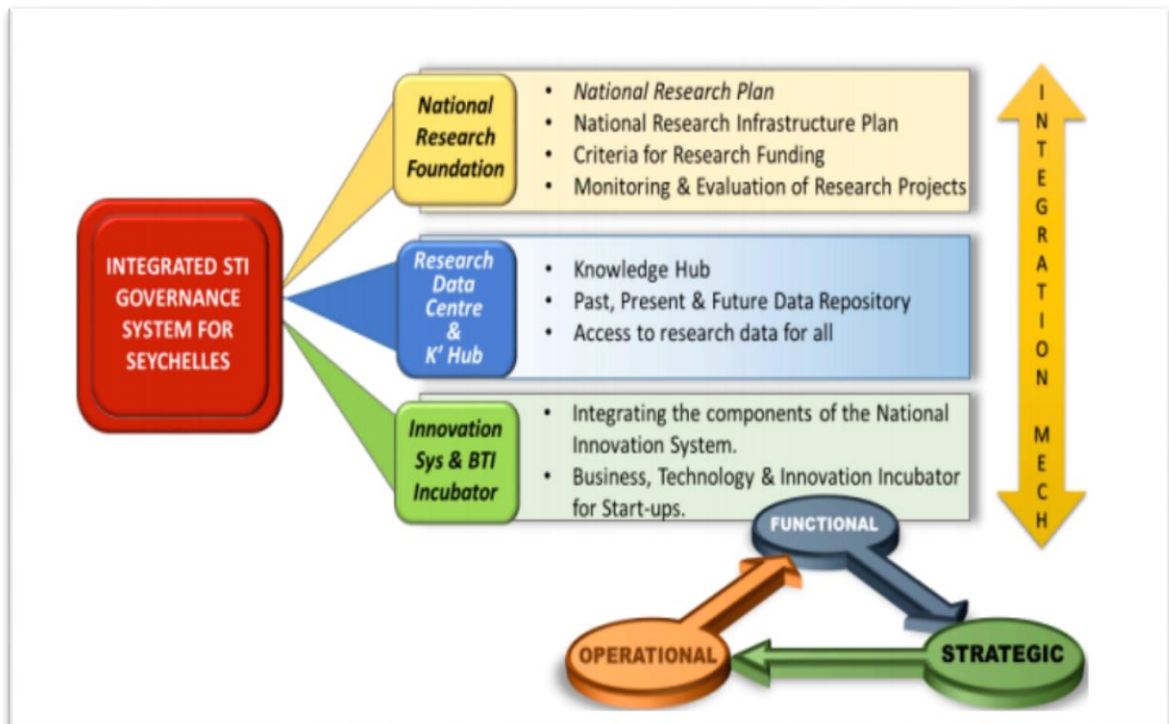


Figure 7 : Integrated STI governance System for Seychelles