Sri Lanka Science & Technology Statistical Handbook 2013

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INTRODUCTION

Sri Lanka Science and Technology Statistical Handbook 2013 comprises the findings of the National Research and Development Survey 2013 conducted by the National Science Foundation (NSF), Sri Lanka. This Handbook mainly focuses on the policy authorities, scientists, researchers, donors, and other stakeholders who are interested in having a broad picture of the status of S&T sector in the country during the year 2013.The statistical indicators given in the book have been worked out using the international Standardization of Statistics on science and technology (UNESCO,2010) and the Frascati Manual 2002 (OECD, 2015) for international comparability while the data contain most up to date evidence based information as well as the related information pertaining to the past years.

The data presented in the Handbook also gives a qualitative analysis of the whole S&T sector of the country namely, the higher education Institutions; R&D Institutions; S&T institutions (S&T management, administration and services); Industries; and the national and international non-governmental institutions. In most cases, the data given in this Handbook is relevant to the surveyed year of 2013 depicting different perspectives. Readers will be able to obtain a comprehensive overview of S&T statistics under many different indicators and to interpret further, based on these data.

Sri Lanka Scienceand Technology Statistical Handbook 2013 has been prepared by the Science and Technology Policy Research Division (STPRD) of the National Science Foundation, Sri Lanka.

Dr Seetha I. Wickremasinghe
Acting Director General
National Science Foundation

December 2015

TECHNICAL NOTES

Research, development and innovation consists of people, institutions, proceses, infrastructure, linkages and collaborations that occur in the generation, diffusion and absorption of scientific and technological knowledge. The capability, performance and efficiency of Sri Lanka's Science, Technology and Innovation system is crucial for advancement of future economic prosperity, social development, standard of living and quality of life.

This survey covered the following 04 major S&T sectors:

a. Higher Education sector (State and Private)- full coverage

b. State S&T sector that included Research Institutions, and S&T service providing Institutions – Full coverage

c. Business Enterprises – 250 institutions were selected for the survey considering the size of the establishment, volume and intensity of their R&D activity, and proportion of their contribution to the national economy. All the major industries that conduct substantial amount of R&D were included into the sample.

d. Private Non Profit Institutions – all institutions that were involved in the activities related to S&T were covered in the survey

The data, wherever possible are presented in conformity with the standard and methodologies stipulated by UNESCO and OECD. International standard classifications relevant to Science, Technology and Innovation were followed in the formulation of the questionnaire, development of indicators, and in the presentation of data and other information.

HIGHLIGHTS-2013

- Sri Lanka had spent a total of Rs. million 9,670.00 (USD million 73.3) on R&D in 2013. This corresponds to 0.11% of the GDP of the country, which was lower than the expenditure incurred in 2010 (0.16 % GDP).
- The annual investment on R&D by the government of Sri Lanka was to Rs. million 5,209.97, which is 53.88% of the total R&D expenditure of 2013 and 0.06 of the GDP.
- The business enterprise sector contribution for R&D expenditure had increased to Rs. million 3,934.04, which was 40.68% of the total R&D expenditure of 2013 and 0.05 of the GDP.
- Foreign investment sector contribution to R&D expenditure was Rs. million 486.17, which was 5.03 % of the total R&D expenditure of 2013 and 0.006 of the GDP, while contribution by other sources was Rs. million 39.83, which was 0.41% of the total R&D expenditure of 2013 and 0.0005 of the GDP.
- 34.81% (Rs. million 3,365.95) of the R&D expenditure had been invested in the state sector organizations (R&D institutes and S&T service sector institutions), and 19.97% (Rs. million 1,931.12) had been in the higher education institutes and 44.88 % (Rs. million 4,339.60) in the business enterprise sector.
- 57% of the R&D expenditure was invested in applied research followed by 33% on experimental development research and 10% on basic research.
- In 2013, 33% of the total R&D expenditure was spent on engineering sciences & technologies, followed by 27.9 % in agricultural sciences, 24.6% in natural sciences, 9.4 % in medical sciences, and 4.9 % in social science and humanities. 0.2% of it was spent on multidisciplinary research activities that were difficult to categorize.

- In 2013, Sri Lanka had a total Science and Technology work force (STP) of 113,447 that were engaged in S&T related activities in the S&T related organizations and business enterprises. 11.12% of this number comprised scientists, engineers and professionals engaged in R&D, testing, constructions and other service based activities including administration and management. 14.25 % of STP comprised technicians, while 74.63 % were supporting staff.
- In 2013, the number of scientists engaged in the R&D work (full time or part time) was 5,705 and the number of technicians was 3,200.
- 46.77% of R&D scientists were employed in the higher education sector, while 31.88% were in the government organizations, 21.1% in the Business Enterprises and 0.25% in Private Non Profit (PNP) organizations respectively.
- The highest number of R&D scientists were engaged in research in natural sciences (25%). This was followed by engineering and technology (20%), agriculture sciences (19%), medical sciences (17%), social science and humanities (12%) and 7% in other fields.
- In 2013, 39% of the total R&D scientists were females.
- The total number of Full-Time Equivalent (FTE) researchers was 2,276, of which 37% were female scientists.
- Out of the total number of Full-Time Equivalent (FTE) researchers, 45% were in the government sector organizations, 23 % in higher education, 31% in business enterprises and 1% in Private Non Profit (PNP) organizations.
- In 2013, the number of patents registered by the Patent Office of Sri Lanka was 491, of which 326 were by Sri Lankan residents and 165 by the non-residents.
- In 2013, 391 articles were published by the Sri Lankan scientists in the SCI journals, of which 77% were with foreign co-authors.
- In 2013, 1,857 scientific personnel completed postgraduate degrees, which included 27-Ph.D; 251 -MS/MD; 82-M. Phil; 1018 M.Sc./M. Eng.; and 5,479 -Postgraduate Diploma.

- In 2013, the government R&D institutions developed 28 new products, transferred 06 of their technologies and commercialized 05.
- In 2013, the government R&D institutions developed 18 new processes, transferred 03 and commercialized 05.
- In 2013, the government R&D institutions improved 14 existing products and 06 existing processes. They transferred 04 products and 01 process technologies and commercialized 05.
- In 2013, the government R&D institutions produced 16 new plant varieties and hybrids, transferred 09 and commercialized 07.
- In 2013, the government R&D institutions designed 06 prototypes, but none were commercialized.
- In 2013, the higher education sector institutions, developed 25 new products, transferred 02 of their technologies and commercialized 14.
- In 2013, higher education sector institutions developed 06 new processes, transferred none and commercialized 05.
- In 2013, the government R&D institutions improved 09 existing products and 05 existing processes. They transferred 01 process technology and commercialized 04.
- In 2013, higher education sector institutions designed 10 prototypes but none were commercialized.

Abbreviations

FTE	Full Time Equivalent
GDP	Gross Domestic Product
GERD	Gross Expenditure on R&D
IPR	Intellectual Property Rights
IT	Information Technology
MIS	Management Information System
na	not available
NA	Not Applicable
NARESA	Natural Resources, Energy & Science Authority
nes	not elsewhere specified
NSF	National Science Foundation
o/w	of which
OECD	Organization for Economic Co-operation and Development
PCT	Patent Cooperation Treaty
PNP	Private Non Profit
PPP	Perchasing Power Parity
R&D	Research and Development
S&T	Science and Technology
SCI	Science Citation Index
STI	Science, Technology and Innovation
STP	Science and Technology Personnel
STPRD	Science & Technology Policy Research Division
UGC	University Grants Commission
UIS	UNESCO Institute of Statistics

CONTENTS

3. Performance Indicators for Science and Technology

4. Key Socio - Economic Indicators - General

FINANCIAL RESOURCES FOR RESEARCH AND DEVELOPMENT

1.1: Gross Expenditure on R&D (GERD) in Sri Lanka 1966-2013

Year	GDP current prices Rs.million	GERD Rs. million (US$ million)	GERD as percentage of GDP	Total population million	GERD per million population Rs. million
1966	7,529	19.8 (4.1)	0.30	11.5	1.7
1975	11,100	45.1 (6.4)	0.40	13.5	3.3
1984	142,700	257.0 (9.7)	0.18	15.6	16.5
1993	499,800	649.0 (13.1)	0.13*	17.6	36.8
1996	769,900	1,410.0 (23)	0.18	18.3	77.0
2000	1,258,000	1,810.0 (22.9)	0.14*	18.4	98.4
2004	1,800,750	3,807.5 (40.9)	0.21	19.4	196.2
2006	2,939,000	5,119.19 (47.9)	0.17	19.8	258.5
2008	4,410,682	5,047.73 (46.1)	0.11	20.2	249.9
2010	5,605,104	8,778.16 (69.4)	0.16	20.7	424.1
2013	8,674,230	9,670.00 (73.3)	0.11	20.4	472.2

Source: National R&D Surveys Sri Lanka 1996 (NARESA), 2000, 2004, 2006, 2008, 2010 & 2013 (NSF)
*Estimates

Trends in Gross Expenditure on R&D (GERD) in Sri Lanka

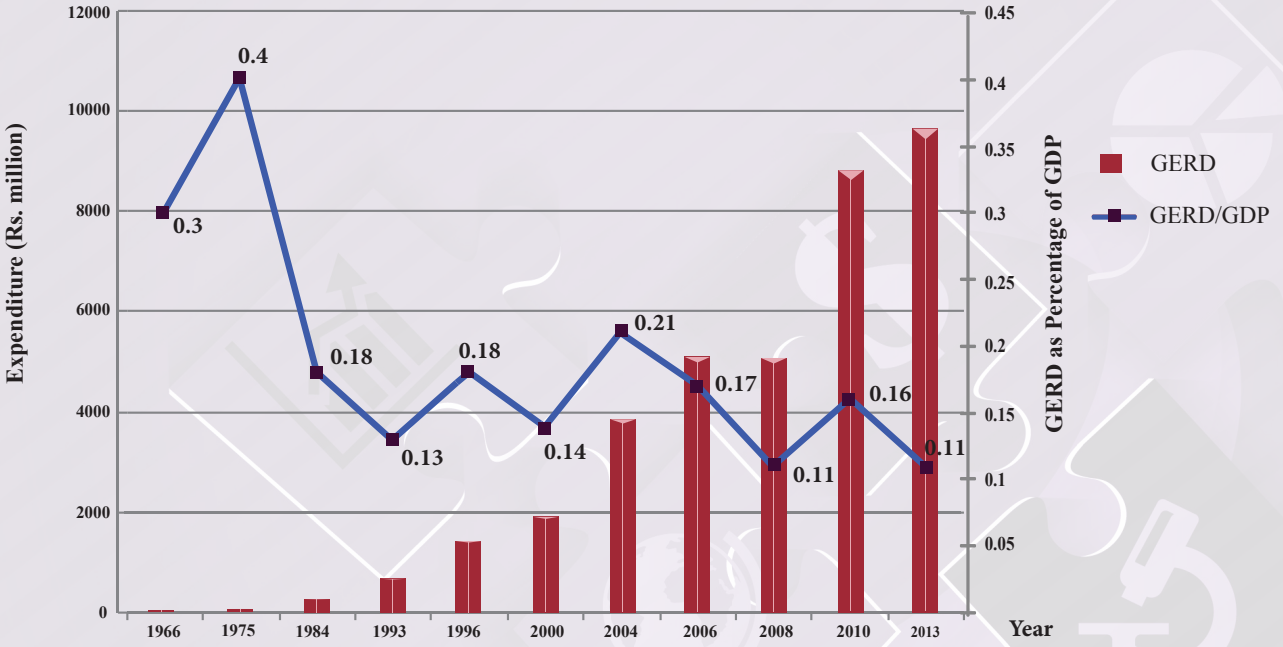


Figure 1

1.2 : Gross Expenditure on R&D (GERD) in selected countries

Country	Year	GERD in Current '000 PPP$	GERD as a % of GDP	GERD per Capita (in PPP$)
Australia	2010	20,469,455	2.39	913.6
Brazil	2011	27,430,035	1.21	139.3
China	2012	243,293,041	1.98	176.7
France	2012	54,679,888	2.26	855.2
Germany	2012	100,247,630	2.92	1210.7
India	2011	36,195,513	0.81	29.6
Indonesia	2009	794,886	0.08	3.3
Iran (Islamic Republic of)	2008	5,969,581	0.75	82.2
Japan	2011	148,389,229	3.39	1165.5
Malaysia	2011	4,902,877	1.07	170.5
New Zealand	2011	1,766,589	1.27	400.2
Pakistan	2011	1,526,889	0.33	8.7
Philippines	2007	339,691	0.11	3.8
Republic of Korea	2011	58,379,654	4.04	1198.0
Saudi Arabia	2009	503,225	0.07	18.8
Singapore	2012	6,771,682	2.1	1276.9
South Africa	2010	3,986,395	0.76	77.5
Sri Lanka	2013*	217,544	0.11	10.7
Thailand	2009	1,339,910	0.25	20.2
United Kingdom	2012	39,109,787	1.72	622.9
USA	2012	453,544,000	2.79	1428.5

Source : Adopted from by UNESCO Statistics 2012

* National R&D Survey, Sri Lanka 2013

1.3 National Gross Expenditure on R&D (GERD) by source of funding 2013

Rs.million

Source of Funding	Recurrent	Capital	Total	GERD as a per-centage of GDP
Government	4,275.47	934.50	5,209.97	0.06
	(44.21%)	(9.67%)	(53.88%)	
Business enterprise	3,524.11	409.92	3,934.03	0.05
	(36.44%)	(4.24%)	(40.68%)	
Foreign	399.94	86.23	486.17	0.00
	(4.14%)	(0.89%)	(5.03%)	
other	34.68	5.15	39.83	0.00
	(0.36%)	(0.05%)	(0.41%)	
Total	**8,234.20**	**1,435.80**	**9,670.00**	**0.11**
	(85.15%)	(14.85%)	(100.00%)	

Source: National R&D Survey, Sri Lanka 2013 (NSF)

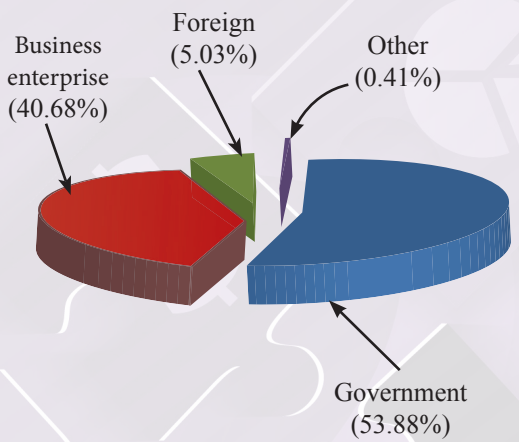


Figure 2

1.4 : Trends in National Expenditure on R&D (GERD) by source of funding 2008-2013

Rs.million

Source of Funding	2008	2010	2013
Government	3,624.41	4,907.16	5,209.97
	(71.8%)	(55.90%)	(53.9%)
Business enterprise	1,004.01	3,592.58	3,934.03
	(19.9%)	(40.93%)	(40.7%)
Foreign	215.59	239.13	486.17
	(4.3%)	(2.72%)	(5.0%)
Other*	203.74	39.29	39.83
	(4.0%)	(0.45%)	(0.41%)
Total	**5,047.73**	**8,778.16**	**9,670.00**
	(100.0%)	(100.0%)	(100.0%)

Sources: National R&D Surveys Sri Lanka, 2008, 2010 & 2013 (NSF)
*Other: funds generated by the institution itself by providing services etc and funds received from Private Non Profit Sector, and non specified

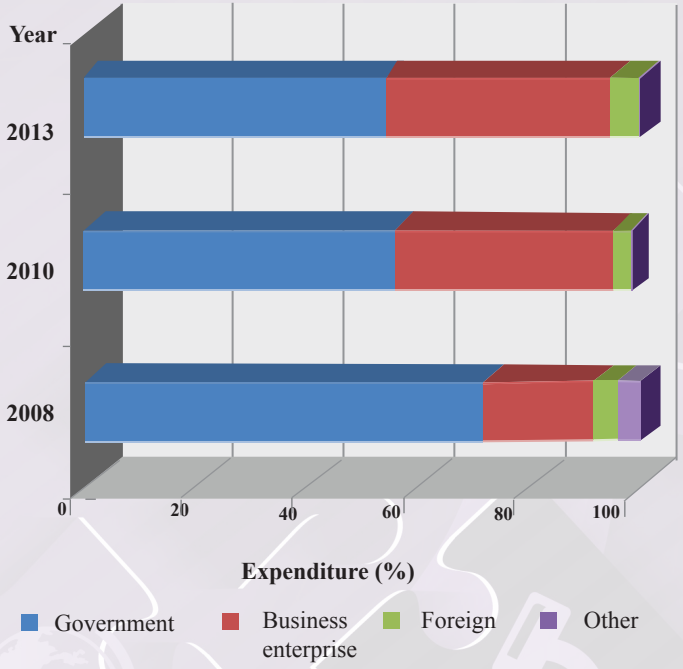


Figure 3

1.5: Trends in National Expenditure on R&D (%GDP) by source of funding 2004-2013

% GDP

Source of Funding	2004	2006	2008	2010	2013
Government	0.14	0.11	0.08	0.09	0.06
Business enterprise	0.00	0.03	0.02	0.06	0.05
Foreign	0.05	0.01	0.01	0.00	0.00
Other*	0.02	0.02	0.00	0.01	0.00
Total	**0.21**	**0.17**	**0.11**	**0.16**	**0.11**

Source: : National R&D Surveys Sri Lanka, 2004, 2006, 2008, 2010 & 2013 (NSF)
*Other: funds from Private Non Profit institution and not defined sources

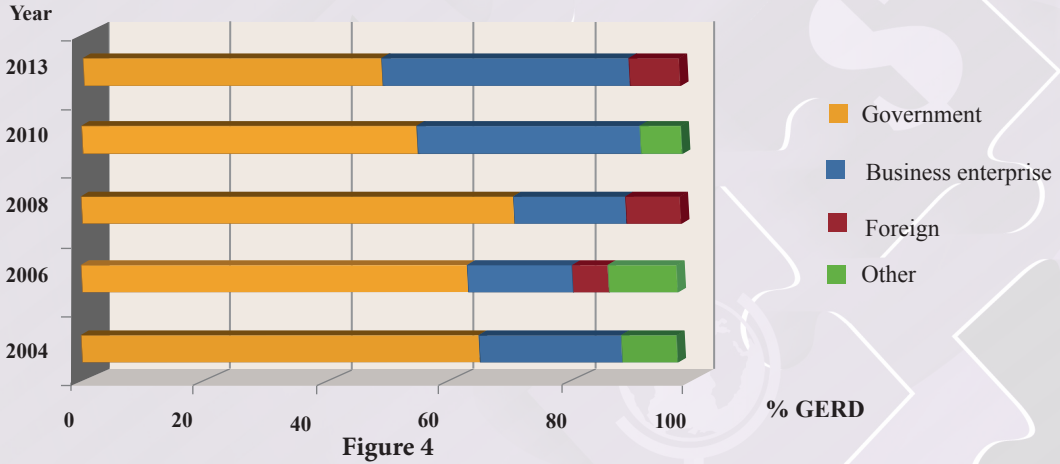


Figure 4

1.6 : National Expenditure on R&D (GERD) by sector of performance 2013

Sector	Recurrent	Capital	Total	%
Government	2,638.84	727.10	3,365.95	34.81
Higher education	1,665.45	265.67	1,931.12	19.97
Business enterprise	3,896.71	442.89	4,339.60	44.88
Private non profit	33.20	0.13	33.33	0.34
Total	**8,234.21**	**1,435.79**	**9,670.00**	**100.00**

Source : National R&D Survey, Sri Lanka 2013

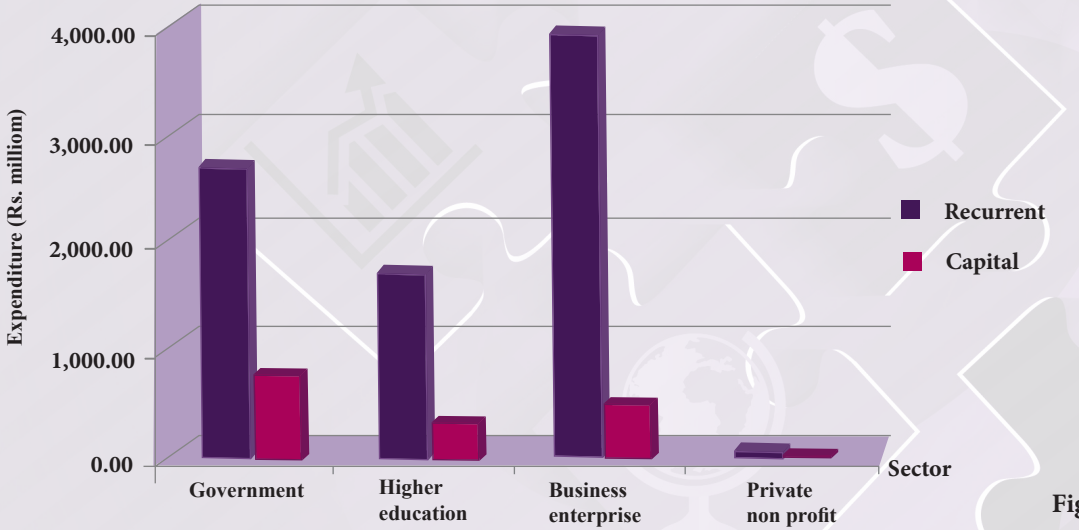


Figure 5

1.7 : Trends in National Expenditure on R&D (GERD) by sectors 2008-2013

Rs.million

Sector	Year		
	2008	2010	2013
Government	1,250.67	3,927.90	3,365.95
	(24.8%)	(44.75%)	(34.81%)
Higher education	2,872.56	1,008.34	1,931.12
	(56.9%)	(11.49%)	(19.97%)
Business enterprise	924.50	3,840.36	4,339.6
	(18.3%)	(43.75%)	(44.88%)
Private non profit	ne	1.56	33.33
		(0.01%)	(0.34%)
Total	**5,047.73**	**8,778.16**	**9,670.00**
	(100.0%)	(100.0%)	(100.0%)

Source : National R&D Surveys, Sri Lanka 2008, 2010 & 2013 (NSF)
ne - not estimated

1.8 Percentage Gross Expenditure on R&D (GERD) by sector of performance in selected countries

Country	%GERD				
	Year	Business enterprise	Government	Higher education	Private non-profit
Australia	2010	58.4	12.0	26.6	3.0
China	2012	76.2	16.3	7.6	na
France	2012	64.2	13.7	20.8	1.2
Germany	2012	66.9	14.8	18.3	na
India	2011	35.5	60.5	4.1	na
Indonesia	2009	18.8	43.2	37.9	na
Iran (Islamic Republic of)	2008	10.6	56.1	33.3	na
Japan	2011	77.0	8.4	13.2	1.5
Malaysia	2011	56.7	14.4	28.9	na
New Zealand	2011	45.4	22.7	31.8	na
Pakistan	2011	-	74.7	25.3	na
Philippines	2007	56.9	17.7	23.3	2.1
Republic of Korea	2011	76.5	11.7	10.1	1.6
Singapore	2012	60.9	10.0	29.0	na
South Africa	2010	49.7	22.7	26.8	0.8
Sri Lanka	2013 *	44.9	34.8	20.0	0.3
United Kingdom	2012	63.4	8.2	26.5	1.8
USA	2012	69.8	12.3	13.8	4.0

Source : adopted from UNESCO statistics 2012; na - not available; nil- no adequate data
*National R&D Surveys, Sri Lanka 2013(NSF)

1.9 National Gross R&D Expenditure (GERD) by nature of research activity 2013

Rs.million

Nature of research	Higher education	Govern-ment	Business enterprise	PNI	Total	%
Basic	107.79	396.93	421.24	33.33	959.29	9.92
Applied	1,430.47	2,673.61	1,414.57	0.00	5,518.65	57.07
Experimental development	392.86	295.41	2,503.80	0.00	3,192.07	33.01
Total	**1,931.12**	**3,365.95**	**4,339.61**	**33.33**	**9,670.00**	**100.00**

Source : National R&D Survey, Sri Lanka 2013 (NSF)

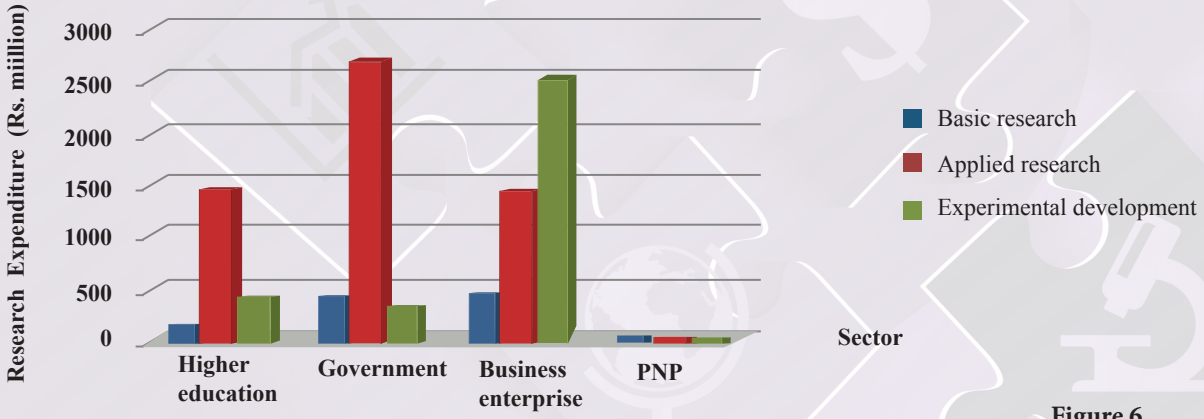


Figure 6

1.10: National Gross R&D Expenditure (GERD) by nature of research activity 2008-2013

Rs.million

Nature of Research	2008		2010		2013	
	Amount	%	Amount	%	Amount	%
Basic research	1,581.1	31.0	956.78	11.0	959.29	10.0
Applied research	2,023.5	40.0	4,302.20	49.0	5,518.65	57.0
Experimental development	1,443.1	29.0	3,519.18	40.0	3,192.07	33.0
Total	**5,047.7**	**100.0**	**8,778.16**	**100.0**	**9,670.00**	**100.00**

Source : National R&D Surveys, Sri Lanka 2006, 2008 ,2010 & 2013 (NSF)

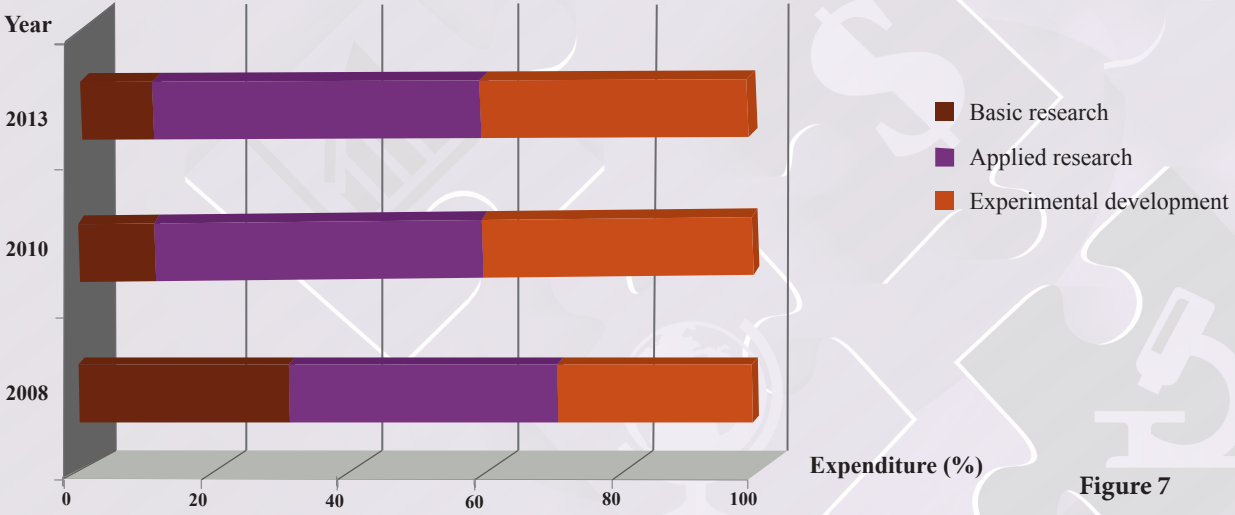


Figure 7

1.11 Percentage GERD by type of R&D activity in selected countries 2008-2010

Country	%GERD				
	Year	Basic research	Applied research	Experimental development	Not specified
Australia	2008	20.1	38.7	41.2	na
China	2012	4.8	11.3	83.9	na
France	2011	24.4	36.9	34.8	3.8
India	2009	16.0	22.3	23.5	38.3
Japan	2011	12.3	21.0	62.1	4.6
Malaysia	2011	17.2	66.4	16.4	na
New Zealand	2011	25.7	41.1	33.2	na
Republic of Korea	2011	18.1	20.3	61.7	na
Singapore	2012	19.6	32.5	47.9	na
South Africa	2010	23.9	39.8	36.3	na
Sri Lanka *	2013	10.0	57.0	33.0	na
Thailand	2009	14.5	37.6	47.9	na
United Kingdom	2011	14.9	48.2	37.0	na
USA	2008	**20.1**	**38.7**	**41.2**	na

Source : http://www.uis.unesco.org/ScienceTechnology/Pages/default.aspx
na- not available; nil- no adequate data
*National R&D Surveys, Sri Lanka (NSF) 2013

1.12: National R&D expenditure by discipline 2008-2013

Rs.million

Discipline	Year		
	2008	2010	2013
Natural sciences	645.0	1,064.11	2,376.55
	(12.8%)	(12.1%)	(24.6%)
Engineering & technologies	1,490.2	1,771.38	3,195.32
	(29.5%)	(20.2%)	(33.0%)
Medical sciences	875.1	498.62	904.37
	(17.3%)	(5.7%)	(9.4%)
Agricultural sciences	1,669.6	2,925.99	2,693.05
	(33.1%)	(33.3%)	(27.9%)
Social sciences & humanities	367.6	577.80	475.77
	(7.3%)	(6.6%)	(4.9%)
Other	0.0	1,940.25	24.08
	(0.0%)	(22.1)	(0.2%)
Total	**5,047.5**	**8,778.16**	**9,670.00**
	(100.0%)	**(100.0%)**	**(100.0%)**

Source : National R&D Surveys, Sri Lanka 2006, 2008, 2010 & 2013 (NSF)

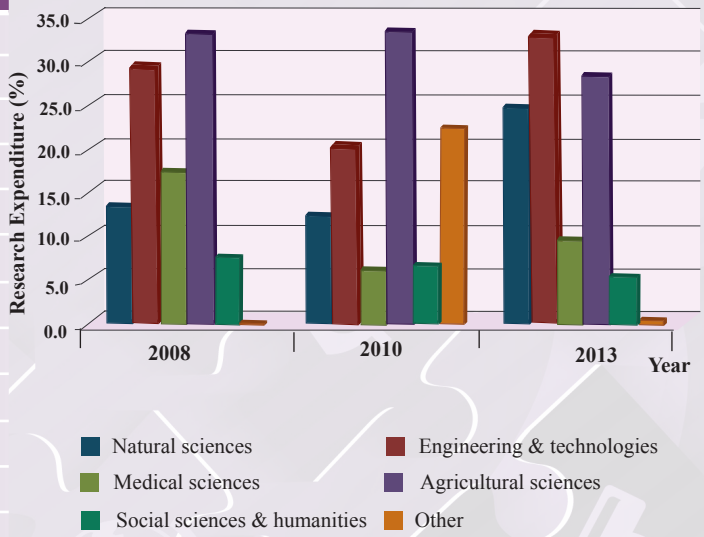


Figure 8

HUMAN RESOURCES
IN
SCIENCE AND TECHNOLOGY

2.1: Distribution of R&D scientists (Headcount) by sector 2010-2013

Sector	2010				2013			
	Scientists		Technicians		Scientists		Technicians	
	No	%	No	%	No	%	No.	%
Government	1,673	32.4	1,703	43.6	1,819	31.88	1,278	39.94
Higher Education	2,315	44.8	865	22.2	2,668	46.77	543	16.97
Business Enterprise	1,169	22.7	1,326	33.9	1,204	21.10	1,366	42.69
Private Non Profit (PNP)	5	0.1	13	0.3	14	0.25	13	0.41
Total	**5,162**	**100**	**3,907**	**100**	**5,705**	**100**	**3,200**	**100**

Source: National R&D Surveys, Sri Lanka 2010 & 2013(NSF)

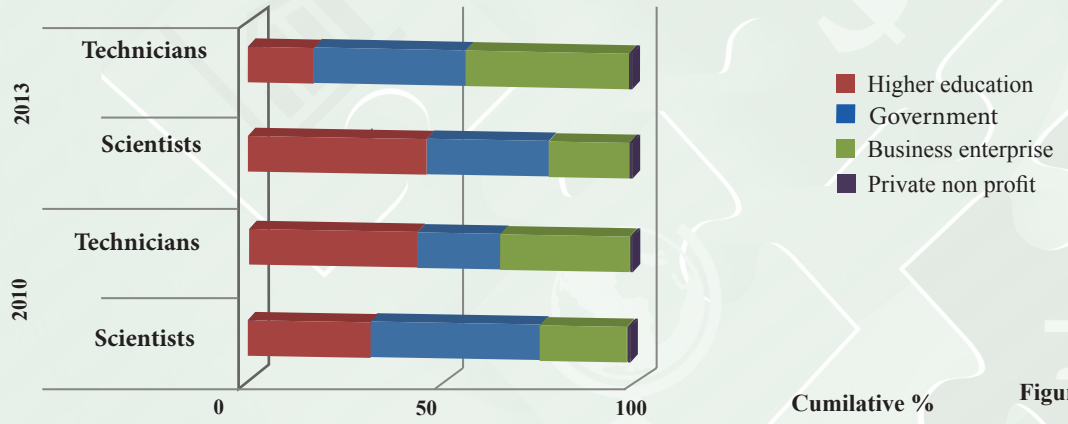


Figure 9

2.2: Number of R&D scientists (Headcount) by discipline and sex 2010-2013

Discipline	Headcount of R&D scientists (2010)						Headcount of R&D scientists (2013)					
	Male		Female		Total		Male		Female		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Natural sciences	877	27	584	31	1,461	29	870	25	529	24	1,399	25
Agricultural sciences	649	20	401	21	1,050	20	657	19	407	18	1,064	19
Engineering & technologies	837	26	310	16	1,147	22	819	24	339	15	1,158	20
Medical sciences	452	14	392	21	844	16	493	14	483	22	976	17
Social sciences & humanities	283	8	120	6	403	8	424	12	283	13	707	12
Other	158	5	99	5	257	5	217	6	184	8	401	7
TOTAL	**3,256**	**100**	**1,906**	**100**	**5,162**	**100**	**3,480**	**100**	**2,225**	**100**	**5,705**	**100**

Source: National R&D Surveys, Sri Lanka 2010 & 2013 (NSF)

Distribution of R&D scientists in different disciplines 2004-2013

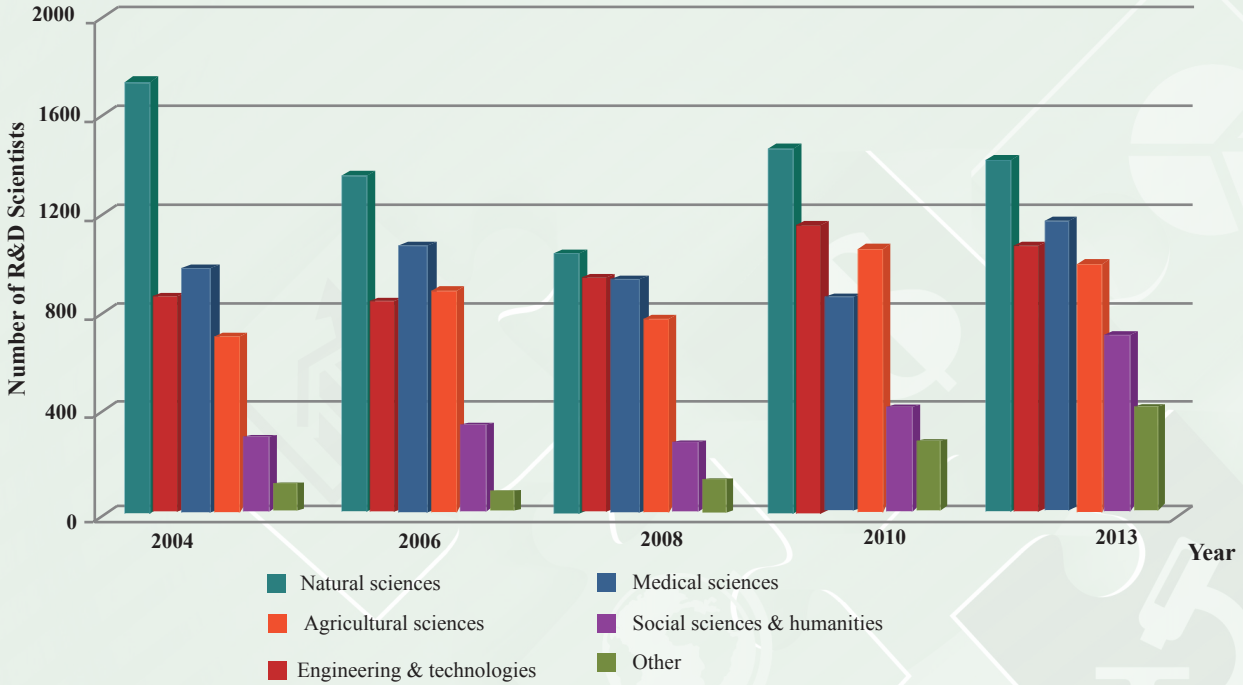


Figure 10

2.3: Educational qualifications of R&D scientists 2013

Qualification	Male		Female		Total	
	No	%	No	%	No	%
Ph.D.	1,051	30	549	25	1,600	28
M. Phil./ M.Sc.	457	13	379	17	836	15
MD/MS	284	8	295	13	579	10
B.Sc. + PG Diploma	146	4	75	3	221	4
B.Sc. Special	624	18	391	18	1,015	18
B.Sc. General	410	12	275	12	685	12
Other	508	15	261	12	769	13
Total	**3,480**	**100**	**2,225**	**100**	**5,705**	**100**

Source: National R&D Survey, Sri Lanka 2013 (NSF)

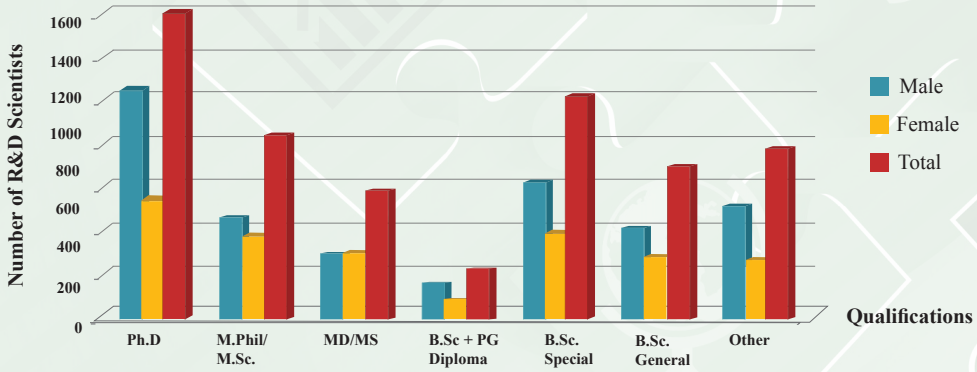
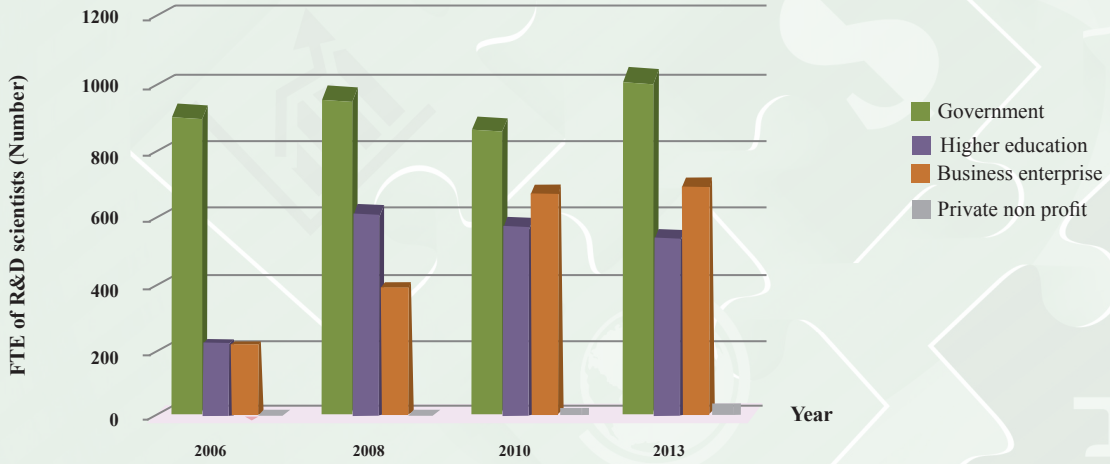


Figure 11

2.4 Distribution of R&D scientists (FTE) by sector and gender 2013

Sector	Full Time Equivalent of R&D scientists			
	Male	Female	Total	% Female
Government	611	419	1030	18
Higher education	301	233	534	10
Business enterprise	507	192	698	8
PNP	6	8	14	0
Total	**1,425**	**851**	**2,276**	**37**

Source: National R&D Survey, Sri Lanka 2013 (NSF)



Trends in R&D Scientists' (FTE) distribution by sector 2006-2010

Figure 12

2.5: Distribution of R&D scientists (FTE) by discipline and by gender 2013

Discipline	Full Time Equivalent of R&D scientists			
	Male	Female	Total	%Female
Natural sciences	453	216	669	32.28
Engineering & technologies	336	118	454	25.99
Medical sciences	146	115	261	44.06
Agricultural sciences	320	216	536	40.53
Social sciences and humanities	121	82	203	40.39
Other	49	104	153	67.97
Total	**1,425**	**852**	**2,276**	**37.43**

Source: National R&D Survey, Sri Lanka 2013 (NSF)

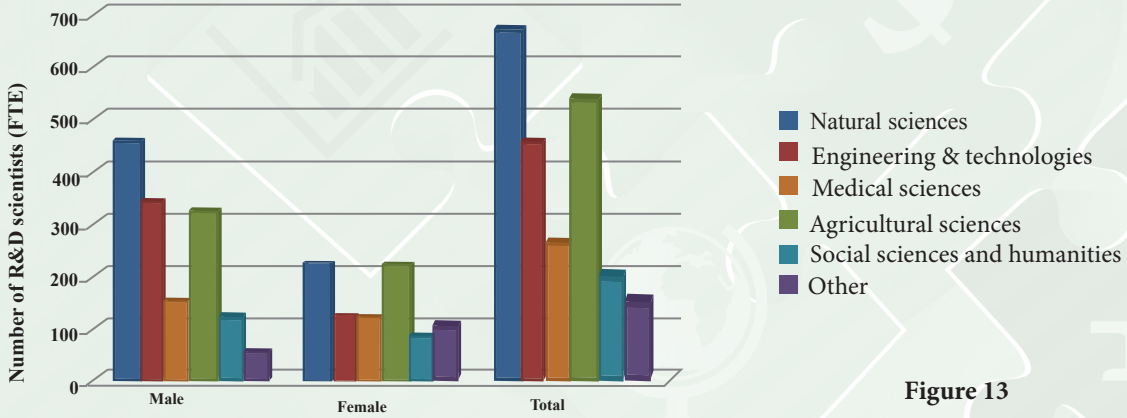


Figure 13

2.6: Number of R&D scientists (Headcounts) by age and sex 2013

Age group	R&D scientists				R&D scientists (FTE)			
	Male	Female	Total	%	Male	Female	Total	%
21-30	414	434	848	15	213	218	432	19
31-40	1,068	759	1,826	32	476	309	785	34
41-50	1,089	650	1,739	30	421	208	629	28
51-60	724	320	1,044	18	258	102	360	16
Above 60	165	42	207	4	52	10	62	3
Not mentioned	21	21	42	4	4	4	8	0
Total	**3,480**	**2,225**	**5,705**	**100**	**1,425**	**851**	**2276**	**100**

Source: National R&D Survey, Sri Lanka 2013 (NSF)

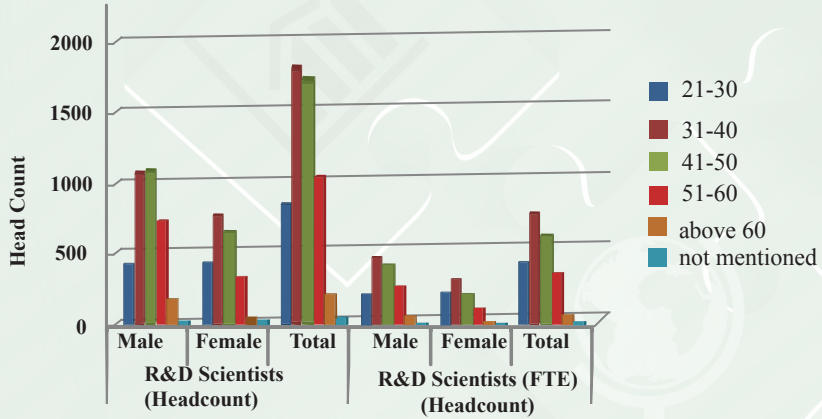


Figure 14

2.7 : Number of R&D scientists in selected countries 2009-2012

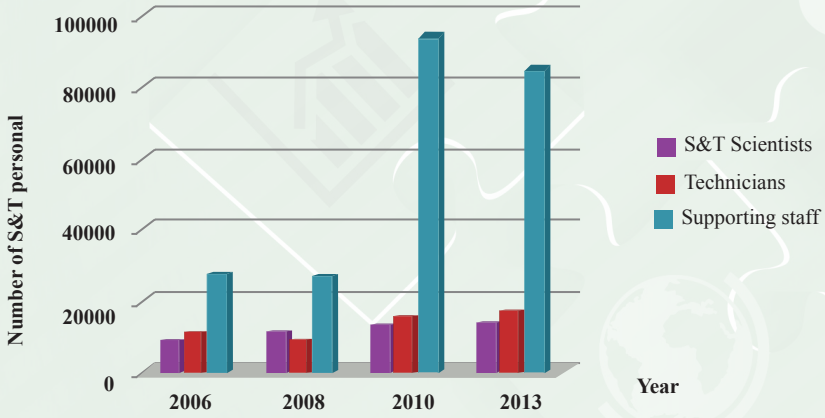
Country	Year (data available)	Researchers per million population	Researchers (FTE) per million population
Belgium	2011	8,579	5,714
Brazil	2010	2,404	1,366
China	2012	3,353	2,358
Cuba	2012	1,294	2,407
France	2011	8,535	6,328
Germany	2011	10,053	6,933
Kuwait	2011	272	272
Iraq	2011	3,397	554
Japan	2011	8,997	6,832
New Zealand	2011	9,674	5,347
Pakistan	2011	740	400
Republic of Korea	2011	10,899	7,415
Singapore	2012	8,486	7,441
Sri Lanka	2013	278	111
ireland	2011	8,057	4,767

Source: Adopted from UNESCO Statistics 2012
*National R&D Surveys, Sri Lanka 2013 (NSF)

2.8 : Science and Technology Personnel (STP) by Category 2010-2013

STP Category	2010			2013		
	Total number	Percent of STP	Per million inhabitants	Total number	Percent of STP	Per million inhabitants
S&T Scientists	12,139	10.05	586.43	12,627	11.12	618.96
Technicians	14,528	12.03	701.83	16,169	14.25	792.58
Other supporting staff	94,130	77.92	4,547.34	84,652	74.63	4,149.6
Total STP	**120,797**	**100**	**5,835.60**	**113,447**	**100.00**	**5,561.14**

Source: National R&D Surveys, Sri Lanka 2010 & 2013 (NSF)



Trends in Science and Technology Personnel distribution 2006-2013 **Figure 15**

2.9 : Distribution of S&T Personnel (STP) by Sector 2010-2013

Sector	2010		2013	
	STP	Percent	STP	Percent
Government	28,247	23.38	18,992	16.74
Higher education	4,609.	3.82	3,873	3.41
Business enterprise	87,909.	72.77	90,546	79.81
Private non profit (PNP)	32	0.03	36	0.03
Total	**120,797**	**100**	**113,447**	**100**

Source: National R&D Surveys, Sri Lanka 2008, 2010 & 2013 (NSF)
Note: Total STP includes all researchers, other Scientists in the Service Sector Institutions, Technicians and Supporting Staff; na-not applicable

Figure 16

2.10 : Distribution of Science and Technology Personnel (STP) by discipline 2010-2013

Discipline	2010		2013	
	No	%	No	%
Natural sciences	22,166	18.3	19,955	17.6
Agricultural sciences	22,891	18.9	21,233	18.7
Engineering & technologies	63,762	52.8	57,195	50.4
Medical sciences	5,280	4.4	6,699	5.9
Social sciences and humanities	4,798	4.0	4,769	4.2
Other /Not specified	1,900	1.6	3,596	3.2
Total	**120,797**	**100.0**	**113,447**	**100.0**

Source: National R&D Surveys, Sri Lanka 2008, 2010 & 2013(NSF)

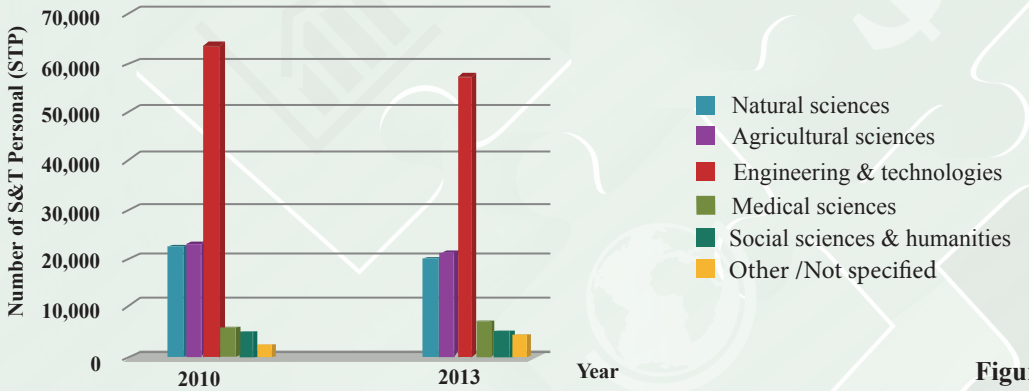


Figure 17

PERFORMANCE INDICATORS FOR SCIENCE AND TECHNOLOGY

3.1 : Number of patents registered locally 2005-2013

Year	Resident	Non resident	Total
2005	64	116	180
2006	68	69	137
2007	54	37	91
2008	89	70	159
2009	111	254	365
2010	219	284	503
2007	54	37	91
2008	89	70	159
2009	111	254	365
2010	219	284	503
2011	195	227	422
2012	243	89	332
2013	326	165	491

Source : Adopted from information of the National Intellectual Property Office of Sri Lanka

3.2 : Number of patents registered by residents by sector 2011 - 2013

Category	2011	2012	2013
S&T institutes	3	13	6
Higher education institutes	8	0	4
Private institutes	11	11	18
Individuals	173	219	298
Total	**195**	**243**	**326**

Source : Adopted from information of the National Intellectual Property Office of Sri Lanka

3.3 : Distribution of Patents granted 2010-2013

Classification	Year			
	2010	2011	2012	2013
Agriculture related developments	8	25	39	44
Construction technology and materials developments	11	6	13	25
Drugs , cosmetics & other related product developments	12	14	21	33
Dryers/ dehydration technologies	2	1	2	2
Energy saving / generating devices	23	14	16	12
Food, beverage process technology and related technologies	12	25	21	22
Development of domestic appliances/utilities	25	17	29	45
IT, telecommunication, electronic and related	9	25	30	49
Packaging and packing materials	3	1	0	0
Process technology	7	5	20	26
Process technology related to Manufacturing sector	12	5	2	5
Rubber production and processing technologies	8	3	6	5
Chemicals productions and related technologies	6	8	2	8
Textile technology and related inventions	4	4	8	3
Automobile and related inventions	19	25	16	31
Other	19	17	18	16
Total	**180**	**195**	**243**	**326**

Source : Adopted from information of the National Intellectual Property Office of Sri Lanka

3.4 : Number of Innovation activities carried out by the government Institutions in 2013

Innovation Category (Number)	Government Sector			Higher Education		
	Developed	Transferred	Commercialized	Developed	Transferred	Commercialized
New product	28	6	5	25	2	14
New processes	18	3	5	6	0	5
Existing products improved significantly	14	4	4	9	0	1
Existing process improved significantly	6	1	1	5	1	3
New plant varieties/ hybrids	16	9	7	0	0	0
Imported substitute	0	0	0	3	0	0
Design Prototypes	6	0	0	10	0	0

Source : National R&D Survey 2013 (NSF)

3.5 : Main fields of research publications by Sri Lankans in the SCI journals 2012 - 2013

Field	2012		2013	
	Total number	% With foreign co-authorship	Total number	% With foreign co-authorship
Agriculture	29	86.2	37	73.0
Biological science	20	90.0	20	85.0
Molecular biology & biotechnology	37	94.6	39	79.5
Chemical science	20	70.0	22	81.8
Earth Sciences	18	88.9	18	72.2
Engineering & Technologies	4	50.0	13	69.2
Environmental Science	27	81.5	36	88.9
fisheries, Aquaculture	2	100.0	6	100.0
food science	19	84.2	17	88.2
Forestry	19	100.0	12	100.0
Health science	114	80.7	122	72.1
Mathematics	2	50.0	5	80.0
Nanotechnology	32	90.6	14	92.9
Physics	11	54.5	17	47.1
Veterinary	6	100.0	2	100.0
Social Sciences	6	16.7	11	54.5
Total	**366**	**83.1**	**391**	**77.0**

Source : Adopted from the SCI database; SCI : Science Citation Index

Publication trends in the SCI journals by Sri Lankan scientists 2004-2010

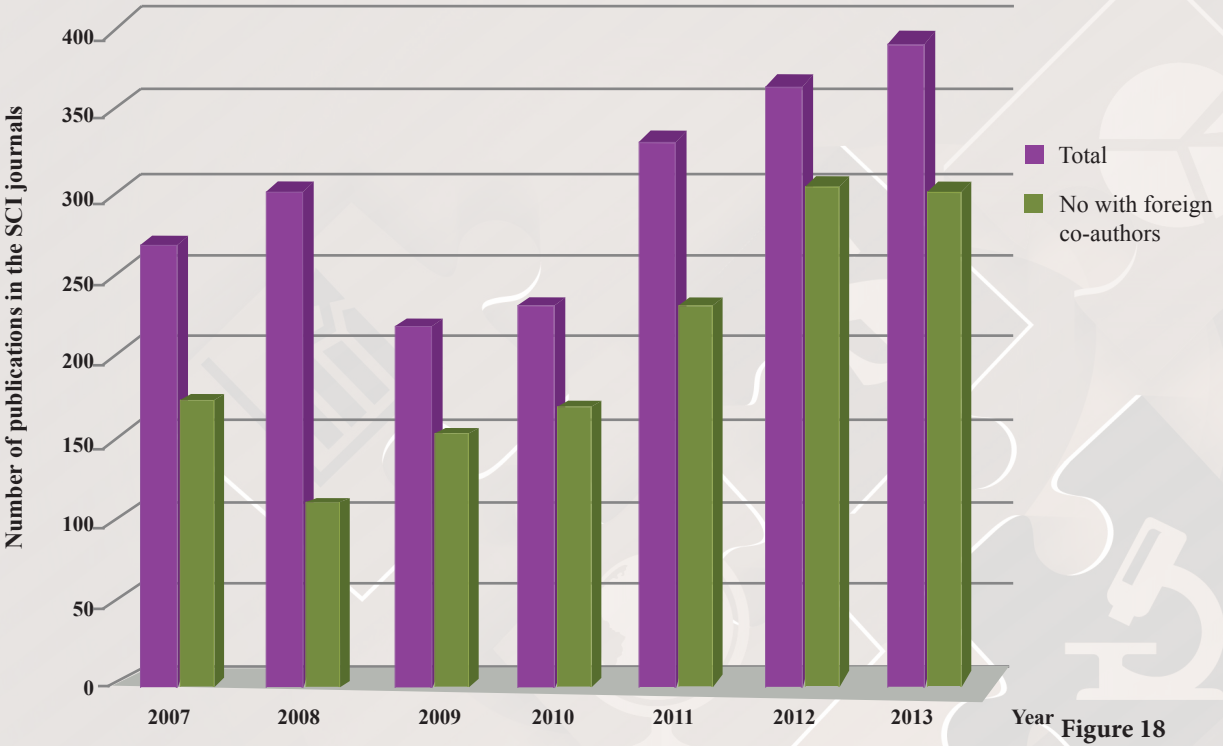


Figure 18

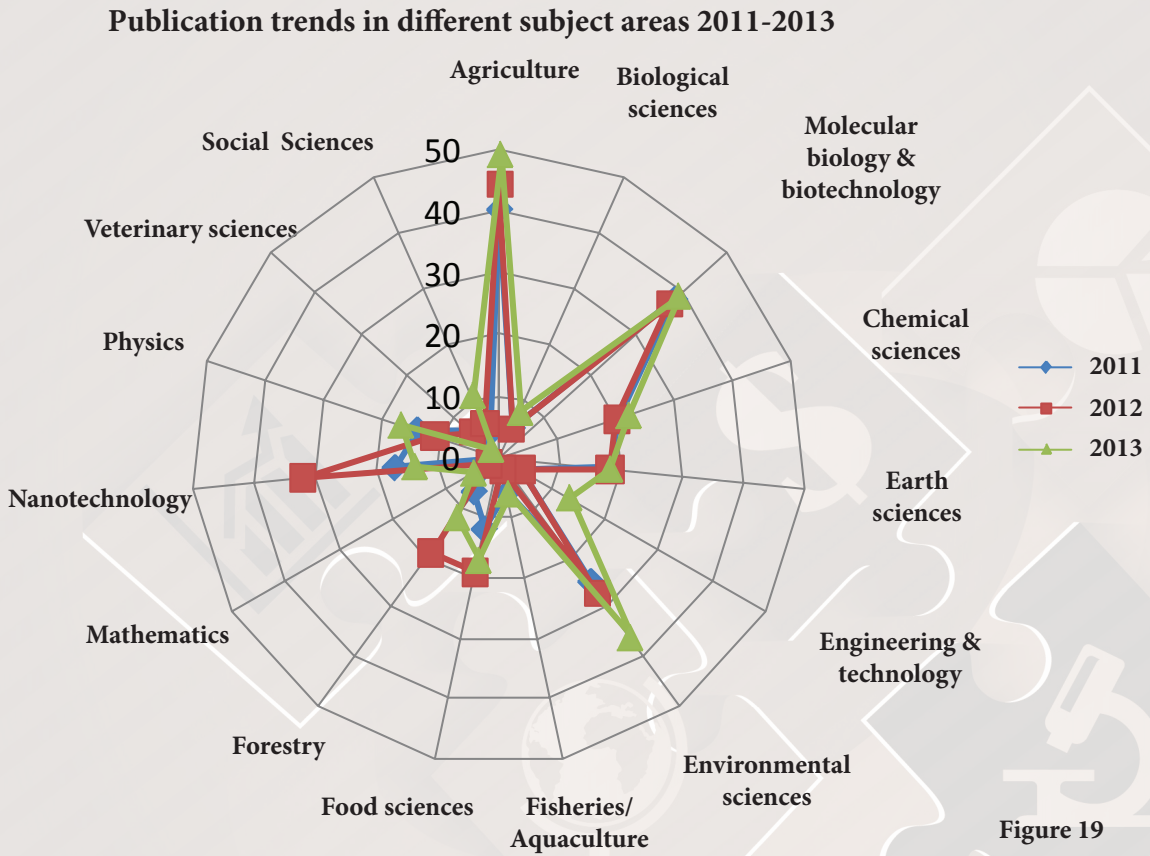

Publication trends in different subject areas 2011-2013
Agriculture
Biological sciences
Molecular biology & biotechnology
Chemical sciences
Earth sciences
Engineering & technology
Environmental sciences
Fisheries/ Aquaculture
Food sciences
Forestry
Mathematics
Nanotechnology
Physics
Veterinary sciences
Social Sciences
50
40
30
20
10
0
2011
2012
2013

Figure 19

3.6 : Knowledge disseminations done during 2011-2013

Publication/ Activity	State Sector		Higher Education	
	National	International	National	International
Books and Book Chapters	46	8	855	269
Journal articles (Index)	74	89	2,960	2,880
Journal articles (other)	107	37	1,540	600
Newspaper articles	177	1	1,782	90
Abstracts	144	78	566	202
Newsletters, handbooks, manuals etc.	14,094	1	702	96
Presentations/ Resource Person seminars/conference	723	88	4,288	694

Source : National R&D survey 2013 (NSF)

3 7 : Sri Lanka S&T postgraduate output 2011 - 2013

Type	Year	Medical	Agriculture	Science/IT	Engineering	Total
PG Dip.	2011	303	01	177	16	497
	2012	164	00	140	09	313
	2013	310	11	156	02	479
MSc./MEng.	2011	62*	109*	310*	196*	677*
	2012	68	176	284	101	629
	2013	47	170	591	210	1,018
M.Phil.	2011	-	-	-	-	-
	2012	04	24	38	05	71
	2013	04	23	43	12	82
MS/MD	2011	00	00	00	00	00
	2012	00	00	00	00	00
	2013	251	00	00	00	251
Ph.D.	2011	256	04	06	09	275
	2012	229	07	08	04	248
	2013	02	07	16	02	27
Total	**2011**	**621**	**114**	**493**	**221**	**1,449**
	2012	**465**	**207**	**470**	**119**	**1,261**
	2013	**614**	**211**	**806**	**226**	**1,857**

Source : UGC Statistics 2013

3.8 : World Statistics of Researchers by Formal Qualification & Sex

Country	Year	Researchers					
		Total	PhD, or similar level %	Bachelor or Master	short occupancy programmes	All other qualifications%	Researchers -Female (%)
Austria	2011	65,609	28.5	51.3	3	17.2	29
Belgium	2011	63,207	27.1	57.2	10.8	4.9	33.5
Bulgaria	2011	14,794	52.3	46.1	0.7	1	49.1
Chile	2010	9,453	41.7	52	0.7	5.6	32.4
China*	2011	612	66.8	30.9	0.3	2	37.7
Greece	2011	45,239	45.4	50	2.5	2.1	36.7
Iraq	2011	40,521	37.1	62.9	(n)	(n)	34.2
Malaysia	2011	73,752	45.1	33.5	15.7	1.8	48.7
Pakistan	2011	51,954	16.9	75.8	(n)	7.4	27.2
Russian Federation	2011	374,791	29.2	70.8	(n)	(n)	41.4
Singapore	2012	38,432	21.8	72	(n)	6.2	29.6
South Africa	2010	37,901	52.9	37.6	9.4	(n)	41.7
Sri Lanka	2010	5,162	26	69.2	(n)	4.8	36.9
Turkey	2011	137,452	42.3	55.1	1.5	1.1	35.6

Source: Adopted from UIS statistics
(n) Magnitude nil or negligible
* Macao Special Administrative Region

KEY SOCIO-ECONOMIC INDICATORS

4.1: Demographic Indicators of Sri Lanka 2011-2013

Item	2011	2012	2013
Mid-Year population, '000	20,869	20,328	20,483
0-14 Years	5,488	5,132	5,171
15-54 Years	12,625	11,629	11,718
55 Years and over	2,756	3,567	3,594
Growth of population, %	1	0.9	0.8
Crude birth rate, per 1,000 population	17.4	17.5	17.9
Crude death rate, per 1,000 population	5.9	6.0	6.2
Rate of natural increase, per 1,000 population	11.5	11.5	n.a.
Net migration rate, per 1,000 population	-2.2	-2.6	-2.3
Infant mortality rate, per 1,000 live births	9.4(b)	n.a.	n.a.
Density of population, persons per Sq.Km.	333	324	327

Sources : Sri Lanka Socio-Economic Data 2014, Central Bank of Sri Lanka
(a) Provisional
(b) 2009
n.a. – Not available

4.2: Demographic Indicators: SAARC countries

Indicator	Ref. Year	Sri Lanka	Afghan-istan	Bangla-desh	India	Mal-dives	Nepal	Pak-istan
Mid-Year population, Mn.	2013	20.5	27.5	154.7	1,228.80	0.4	27.3	181.7
Population growth, %	2013	1	1.9	1.4	1.3	3.5	1.4	0.6
Land area, '000 Sq.km.	2003	65.6	n.a.	130.2	2,973.2	0.3	143	770.9
Density of population [Persons per Sq. km.] (a)	2011	333.3	40.6	1,097.8	402.9	1,083.7	185.6	229.7
0-14 Years	2013*	25.2	46.6	30	29.1	28.7	34.7	33.8
15-64 Years	2013*	66.4	51	65.2	65.6	66.3	60.2	61.8
65 Years & above	2013*	8.5	2.3	4.8	5.3	4.9	5.1	4.4
Urban population, %	2013	60.2	22.9	25.9	30.5	40.5	17	33.7
Crude birth rate, Per 1,000	2012	18.1	35.3	20.3	20.7	22.2	21.6	25.7
Crude death rate, Per 1,000	2012	7	8.1	5.7	7.9	3.4	6.7	7
Total Fertility Rate [Births per Women]	2012	2.3	5.1	2.2	2.5	2.3	2.4	3.3
Infant mortality rate [per 1,000 live births	2010	14	103	38	48	14	41	70
Maternal mortality rate [per 100,000 live births]	2010	35	460	240	200	60	170	260
Expectation of life at birth, Years	2012	75.1	49.1	69.2	65.8	77.1	69.1	65.7

Sources : Key Indicators for Asia and the Pacific 2012 & 2014, ADB FAOSTAT Database Access website (www.faostat.fao.org)
*The United Nations Population Division projected the country's population based on the medium-fertility variant where fertility is above 2.1 children per woman in 2005–2010 censuses
(a) Population / Land area without Inland Water
Human Development Report 2013, UNDP ,Central Bank of Sri Lanka
Economy sources; United Nations Population Division, Department of Economic and Social Affairs. World Population Prospects: The 2012 Revision.
ttp://esa.un.org/unpd/wpp/Excel-Data/migration.htm (accessed June 2014)

4.3: Social Indicators: SAARC Countries

Indicator	Ref. Year	Sri Lanka	Afgani-stan	Bangla-desh	India	Mal-dives	Nepal	Paki-stan
Human Development Index (a)(Max.:1,000; Min.: 0.000)	2013	0.75	0.468	0.558	0.586	0.698	0.54	0.537
Literacy Rate, % (15 Years and over)								
Male	2012	n.a.	45.4(f)	62.5	n.a.	n.a.	71.1(f)	67(f)
Female	2012	n.a.	17.6(f)	55.1	n.a.	n.a.	46.7(f)	42(f)
Physicians per 10,000 people	2010	7.3 (a)	2.1 (a)	3.0 (h)	6.5 (a)	16.0 (e)	2.1 (c)	8.1 (a)
Hospital Beds per 10,000 people	2010	33.7 (a)	4	3.0 (f)	9.0 (f)	43.0 (a)	50.0 (b)	6.0 (a)
Daily News Papers per 1,000 Persons	2000	29	n.a.	9	60	n.a.	12	39
Television Sets per 1,000 Persons	2004	117	n.a.	59	83	n.a.	8	150
Radios per 1,000 Persons	2004	215	n.a.	49	120	n.a.	39	105
Per Capita Electricity Consumption (kWh)	2011	490	38(j)	259	684	521	106	449
Internet Subscriptions, per 1,000 people (k)	2011	17.18	0.06 (d)	0.45	10.71	68	3.56	4.17
Telephones per 1,000 Persons (Main Lines)	2011	173	1	11	27	80	32	32
Telephones per 1,000 Persons (Mobile Phones)	2011	877	663	595	746	1,768	502	615
Labour Force Participation Rate, %								
Male	2011	66.2	n.a.	82.5 (b)	55.0 (a)	n.a.	n.a.	68.7
Female	2011	31.2	n.a.	36.0 (b)	18.6 (a)	n.a.	n.a.	21.7
Unemployment Rate, %	2011	4.2	3.4 (c)	4.5 (d)	2.5 (a)	11.7 (b)	2.7 (d)	5.9

Sources : Key Indicators for Asia and the Pacific 2012 & 2014, ADB 2012 & 2014, ADB
Human Development Report 2013, UNDP
Department of Census and Statistics
a) 2009 (b) 2010 (c) 2004 (d) 2008 (e) 2007 (f) 2009 (h)2011 (j)2012 n.a. – Not available

4.4: Economic Indicators : National Output and Expenditure

Sector	Value (a) (Rs. Million)		As a Share of GDP (%)		Rate of Change (%)	
	2012 (b)	2013 c)	2012 (b)	2013 (c)	2012 (b)	2013 (c)
AGRICULTURE	**336,817**	**352,641**	**11.1**	**10.8**	**5.2**	**4.7**
Agriculture, Livestock and Forestry	295,923	309,192	9.7	9.5	4.7	4.5
Fishing	40,894	43,449	1.3	1.3	9.3	6.2
INDUSTRY	**925,152**	**1,016,886**	**30.4**	**31.1**	**10.3**	**9.9**
Mining and Quarrying	84,672	94,388	2.8	2.9	18.9	11.5
Manufacturing	520,938	559,843	17.1	17.1	5.2	7.5
Electricity, Gas and Water	72,452	79,913	2.4	2.4	4.2	10.3
Construction	247,091	282,742	8.1	8.7	21.6	14.4
SERVICES	**1,783,318**	**1,896,572**	**58.6**	**58.1**	**4.6**	**6.4**
Wholesale and Retail Trade	701,408	739,826	23	22.7	3.7	5.5
Hotel and Restaurants	21,029	25,715	0.7	0.8	20.2	22.3
Transport and Communication	435,872	476,721	14.3	14.6	6.2	9.4
Banking, Insurance and Real Estate etc.	269,744	285,750	8.9	8.7	6.7	5.9
Ownership of Dwellings	76,926	79,175	2.5	2.4	1.7	2.9
Government Services	207,559	213,439	6.8	6.5	1.4	2.8
Private Services	70,779	75,946	2.3	2.3	5.5	7.3
GROSS DOMESTIC PRODUCT	**3,045,288**	**3,266,099**	**100.0**	**100.0**	**6.3**	**7.3**
GROSS NATIONAL PRODUCT	**2,983,034**	**3,177,645**	-	-	**5.3**	**6.5**

Source : Annual Report 2013, Central Bank of Sri Lanka
(a) At constant (2002) prices, (b) Revised, (c) Provisional

4.5: Composition of Exports 2012-2013

US Dollars million

Category	2012		2013 (a)		Change in Value	Y-O-Y (b) Change %	Contribution to Change %
	Value	Share %	Value	Share %			
Agricultural Exports	**2331.5**	**23.9**	**2581.1**	**24.8**	**249.6**	**10.7**	**40.2**
Tea	1411.9	14.4	1542.2	14.8	130.3	9.2	21
Rubber	125.1	1.3	71.3	0.7	-53.8	-43	-8.7
Coconut	208. 9	2.1	204.6	2	-4.3	-2	-0.7
Other Agricultural Products (c)	585.6	5.9	762.9	7.3	177.3	189.9	28.7
Industrial Exports	**5,305.4**	**74.9**	**6,172.8**	**74.3**	**867.3**	**16.4**	**70.9**
Food, Beverages and Tobacco	284.3	2.9	235.2	2.3	-49.1	-17.3	-7.9
Textiles and Garments	3991.1	40.8	4508.3	43.4	517.2	13	83.3
Petroleum Products	463	4.7	427.7	4.1	-35.2	-7.6	-5.7
Rubber Products	859.4	8.8	887.8	8.5	28.4	3.3	4.6
Ceramic Products	35.8	0.4	40.4	0.4	4.6	13	0.7
Leather, Travel Goods and Footwear	55.4	0.6	76.8	0.7	21.5	38.7	3.5
Machinery and Equipment	297.5	3	312.3	3	14.8	5	2.4
Gem, Diamond and Jewellery	558.9	5.7	445.5	4.3	-113.4	-20.3	-18.3
Other Industrial Exports	619.2	6.3	632.7	6.1	13.5	2.2	2.2
Mineral Exports	**61.3**	**0.6**	**51.6**	**0.5**	**-9.7**	**-15.9**	**-1.6**
Unclassified	**9.6**	**0.1**	**12.2**	**0.1**	**2.6**	**26.6**	**0.4**
Total Exports (d)(e)	**9,773.5**	**100**	**10,394.3**	**100**	**620.7**	**6.4**	**100**

Source : Annual Report 2013, Central Bank of Sri Lanka

(a) Provisional, (b) Year over year, (c) Includes spices, vegetables, unmanufactured tobacco, minor agricultural products and seafood, (d) Adjusted, (e) Excludes re-exports

4.6: Composition of Imports 2012-2013

US Dollars million

Category	2012 (a)		2013 (b)		Change in Value	Y-O-Y (c) Change %	Contribution to Change %
	Value	Share %	Value	Share %			
Consumer Goods	**2,995.2**	**15.6**	**3,182.5**	**17.7**	**187.3**	**6.3**	**-15.8**
Food and Beverages	1,304.4	6.8	1,368.1	7.6	63.7	4.9	-5.4
Other Consumer Goods	1,690.8	8.8	1,814.4	10.1	123.6	7.3	-10.4
Intermediate Goods	**11,577.6**	**60.3**	**10,553.7**	**58.6**	**-1,023.8**	**-8.8**	**86.2**
Fuel	5,044.6	26.3	4,308.2	23.9	-736.4	-14.6	62
Fertilizer	311	1.6	238.7	1.3	-72.3	-23.3	6.1
Chemical Products	669.7	3.5	734.3	4.1	64.6	9.6	-5.4
Textiles and Clothing	2,266.4	11.8	2,045.8	11.4	-220.5	-9.7	18.6
Diamonds and Precious Metals	587.7	3.1	482.9	2.7	-104.9	-17.8	8.8
Other Intermediate Goods	2,334.4	12.2	2,420.8	13.4	86.4	3.7	-7.3
Investment Goods	**4,589.8**	**23.9**	**4,252.7**	**23.6**	**-337.1**	**-7.3**	**28.4**
Machinery and Equipment	2356	12.3	2,221.9	12.3	-134.1	-5.7	11.3
Transport Equipment	991.9	5.2	667.8	3.7	-324.1	-32.7	27.3
Building Materials	1,237.4	6.4	1,357.2	7.5	119.8	9.7	-10.1
Other Investment Goods	4.5	…	5.8	…	1.3	28.5	-0.1
Unclassified Imports	27.7	0.1	13.9	0.1	-13.8	-50	1.2
Total Imports(d)(e)	19,190.2	100	18,002.8	100	-1,187.4	-6.2	100
Total Imports (b)(c)	**10,206.6**	**100**	**13,511.7**	**100.0**	**3,305.0**	**32.4**	**100.0**

Source : Annual Report 2013, Central Bank of Sri Lanka

(a) Revised, (b) Provisional, (c) Year over year, (d) Adjusted, (e) Excludes re-exports, (f) Rupee/US dollar exchange rate, n - negligible

4.7 Realised Investments in the Board of Investment (BOI) Enterprises (a) 2008-2010

	Number of Projects		Foreign investment (Rs. Million)		Total investment potential (Rs. Million)	
	2012	2013	2012	2013	2012	2013
Food, beverages and tobacco products	140	132	35,720	35,858	60,382	63,238
Textiles, wearing apparel and leather products	358	341	65,608	70,862	97,591	111,911
Wood and wood products	29	26	9,469	9,212	11,333	10,871
Paper products, publishing and printing	29	28	4,819	5,170	6,234	6,624
Chemical, petroleum, coal, rubber and plastic products	138	128	50,240	61,305	67,894	78,977
Non-metallic mineral products	70	76	16,138	20,294	39,014	43,814
Fabricated metal products, machinery and transport equipment	90	87	20,302	20,691	28,407	29,367
Manufactures products (n.e.s.)	161	152	22,443	23,790	29,740	33,726
Services	1030	1027	603,574	711,776	940,242	1,133,493

Source: Annual Report 2014, Central Bank of Sri Lanka (17_Appendix)
(a) Cumulative figures as at end of the year
n.e.s. not elsewhere specified

4.8 Education Indicators: General Education

Item	2011	2012	2013(a)
Schools (No.)	**10,549**	**10,737**	**10,852**
Government Schools	9,731	9,905	10,012
Private(b)	98	98	104
Pirivenas	720	734	736
Students (No.)	**4,157,885**	**4,194,336**	**4,231,422**
Government Schools	3,972,983	4,004,059	4,037,001
Private	122,041	125,669	127,986
Pirivenas	62,861	64,608	66,435
New Admissions (No.) (c)	**331,491**	**339,143**	**342,450**
Teachers (No.)	**228,336**	**235,924**	**236,070**
Government Teachers	216,397	223,724	223,773
Other (Private Schools and Pirivenas)	11,939	12,200	12,297
Student/Teacher Ratio (Government Schools)	**18**	**18**	**18**
Expenditure on Education (Rs. Mn.) (d)	121,369	136,202	151,801
Expenditure as a % of Total Govt. Expenditure	**8.5**	**8.8**	**9.1**
Expenditure as a % of GDP(e)	**1.86**	**1.8**	**1.75**

Source : Sri Lanka Socio-Economic Data 2014, Central Bank of Sri Lanka
(a) Provisional.
(b) Private Schools approved by the government and schools for children with special needs (This figure excludes international schools which are registered under the Companies Act).
(c) Government Schools only, (d) Government expenditure on General and Higher Education.
(e) Data based on GDP estimates compiled by the Department of Census and Statistics.

4.9 Number of Government schools with G.C.E. (A/L) Science stream 2013

Province	Biological Science	Physical Science	Biological and Physical Sciences	Without science stream	Total
Western	6	4	161	1,170	1,341
Central	10	3	91	1,409	1,513
Southern	9	4	116	977	1,106
Northern	3	5	83	883	974
Eastern	6	2	72	994	1,074
North Western	6	5	79	1,139	1,229
North Central	10		42	735	787
Uva	16	2	59	787	864
Sabaragamuwa	9	3	63	1,049	1,124
Total	**75**	**28**	**766**	**9,143**	**10,012**

Source: Ministry of Education (Sri Lanka Education Information - 2013)

4.10 Advanced Level (12-13) Science Students-2013 (in Government Schools)

Province	Sinhala Medium	English Medium (Students with Primary education in Sinhala)	Tamil Medium	English Medium (Students with Primary education in Tamil)	Total
Western	28,382	2,204	1,105	97	31,788
Central	10,818	623	1,770	252	13,463
Southern	20,124	111	58	0	20,293
Northern	10	0	6,299	261	6,570
Eastern	1,419	0	6,748	53	8,220
North Western	11,099	726	1,107	13	12,945
North Central	5,700	109	236	0	6,045
Uva	5,749	239	169	0	6,157
Sabaragamuwa	9,211	212	304	99	9,826
Total	**92,512**	**4,224**	**17,796**	**775**	**115,307**

Source: Ministry of Education (Sri Lanka Education Information - 2013)

4.11 Education Indicators: University Education 2013

Item	2006	2008	2010
Universities (No.)	15	15	15
Students (No.) (a)	74440	70222 (b)	77,126
Lecturers (No.)	5064	5176	5439
Number Graduated (c)	16686	11614 (d)	20,839
Arts and Oriental Studies	6940	5330	9156
Commerce and Management Studies	2791	1992	4,159
Law	348	445	454
Science	2651	1443	3180
Engineering	1346	167	1,507
Medicine	1061	800	547
Dental Surgery	65	20	73
Agriculture	595	515	727
Veterinary Science	58	54	59
Architecture and Quantity Surveying	211	150	201
Computer Science	439	561	644
Other (e)	181	137	132
New Admissions for Basic Degrees (No.)	22016	28908 (f)(g)	24198 (g)
Admission as a % of Eligible	n.a.	n.a.	16.71

Source: Annual Report 2014, Central Bank of Sri Lanka
(a) Excluding Open University of Sri Lanka and external degree courses
(b) Including Open University of Sri Lanka and external degree courses
used to calculate the Z-score
na – not available

4.12 Health Services Indicators-Public sector 2004-2010

Item	2010	2011	2012	2013
Hospitals (Practicing Western Medicine) (No)	568	592 (a)	593	603
Beds (No)	69501	69731	73,437	74,636
Primary Health Care Units (No)	476	475	480	481
Doctors (No)	14125 (b)	16384 (b)	17,129	17,553
Asst. Medical Practitioners	1158	1097	1061	1057
Nurses (No)	27494	29101	30,136	30,928
Attendants (No)	8189	7477	8403	8091
In-Patients (No.'000)	5591	n.a.	5840	5926
Out-Patients (No.'000)	49871	n.a.	50,631	53861
Ayurvedic Physicians (No) (d)	20004	20353	20,712	21,060
Total Health Expenditure (Rs. mn)	73835	89237	99101	119530
Current Expenditure	60506	74443	81946	99609
Capital Expenditure	13329	14794	17155	19920
Total Health Expenditure as a % of GDP(e)	1.32	1.36	1.31	1.38

Source: Annual Report 2014, Central Bank of Sri Lanka (17_Appendix)
(a) This includes 12 estate hospitals taken over by the government, 4 hospitals refurbished and made functional in Mullaitivu District and 8 Primary Health Care Units upgraded as divisional hospitals
(b) Including intern medical officers
(c) Registered with the Ayurvedic Medical Council
na – not available

4.13: Key indicators of infrastructure development 2006-2010

Commodity	2011	2012	2013
Telecommunication			
Telephones –Wire line Telephones	941,780	999,354	1,062,065
Wireless Local Loop	2,666,612	2,450,037 (b)	1,644,722 (c)
Cellular Phones	18,319,447	20,324,070	20,315,150 (c)
Public Pay Phones	6,458	6,983	6,788
Telephones per 1,000 persons, including cellular phones	17.3	17	13.2 (a)
Cellular Mobiles per 100 Persons	88	100	99 (a)
Internet and e-mail Subscribers	844,749	1,365,655	2,009,456
Postal Services			
Delivery Areas (No)	6,729	6,729	6,729
Post Offices (No)	4,742	4,738	4,628
Public	4,058	4,062	4,026
Main Post Offices	648	651	651
Sub Post Offices	3,410	3,411	3,375
Private	684	676	602
Area Served by a Post Office (Sq. Km)	14	13	14
Population Served by a Post Office (No)	4,401	4,290	4,426
Letters per Inhabitant (No)	12	15	13

Source: Annual Report 2014, Central Bank of Sri Lanka (17_Appendix)
Economic and Social Statistics of Sri Lanka 2014, Central Bank of Sri Lanka
(a) Provisional, (b) Wireless Local Loop telephones declined in 2012 due to the rectification of statistical reporting subsequent to the merger of two companies
(c) Wireless Local Loop telephones and Cellular phones declined in 2013 due to a revision in the classification of active subcribers in January 2013
(d) Include Wireline Services and Wireless Services only, (e) Includes mobile internet connections from 2010 onwards

4.14 Power Sector Performance

Item	2011	2012	2013 (a)	Growth Rate (%)		
				2011	2012	2013 (a)
Installed Capacity (MW)	3,148	3,312	3,371	11.8	5.2	1.8
Hydro	1,401	1,584	1,623	1.4	13.1	2.5
Thermal (a)	1,696	1,638	1,649	22	-3.4	0.7
Other	51	90	99	13.3	76.5	10
Units Generated (GWh)	11,528	11,801	11,954	7.6	2.4	1.3
Hydro	4,619	3,292	6,918	-18	-28.7	110.1
Thermal (a)	6,785	8,339	4,772	35.8	22.9	-42.8
Other	124	170	262	44.4	36.9	54.1
Total Sales by CEB (GWh)	10,024	10,475	10,625	8.2	4.5	1.4
Total Sales LECO (GWh)	1,184	1,216	1,283	5.4	2.7	5.5
Overall System Loss of CEB (%)	11.7	11.2	11.1	-13.3	-4.3	-0.9
Number of Consumers ('000) (b)	5,208	5,477	5,717	5	5.2	4.4
o/w Domestic and Religious	4,610	4,842	5,047	5	5	4.2
Industrial	51	54	56	6.3	5.9	3.7
General Purposes and Hotels	542	576	607	5.7	6.3	5.4

Sources : Central Bank of Sri Lanka Annual Report 2012,2013
(a) Provisional
(b) Inclusive of Independent Power Producers (IPPs)
(c) Inclusive of LECO consumers

4.15: Indicators of Natural Resources and Environment : Deforestation and Pollution

Country	Forest area (% of land area)		"Nitrous Oxide Emissions (thousand metric tons CO2 equivalent)"			Methane Emissions (thousand metric tons CO2 equivalent)		
	2000	2012	1990	2000	2010	1990	2000	2010
Sri Lanka	35	33.3	1,759	2,045	2,132	11,514	9,607	1,1631
Bangladesh	11.3	11	15,151	19,614	26,160	87,090	89,243	10,3080
India	22	23.6	159,463	199,496	234,136	513,639	561,558	621,480
Nepal	27.2	25.4	3,591	4,232	4,508	20,286	21,206	23,512
Pakistan	2.7	2.1	18,442	24,760	30,050	90,807	117,129	155,236
Viet Nam	37.7	46.4	11,577	19,627	33,818	60,474	75,418	111,338
China, People's Republic of	18.9	21.7	318,402	392,367	550,297	1,016,932	1,043,425	1,642,258
Korea, Republic of	65.2	63.8	9,823	17,958	14,686	31,306	30,925	31,984
Indonesia	54.9	51.4	88,950	90,677	91,313	152,210	167,822	218,929
Malaysia	65.7	67.4	13,596	12,944	15,010	23,625	29,242	33,599
Singapore	24.4	23.2	403	6,007	1,871	987	1,691	2,339
Thailand	33.3	31.9	19,479	20,065	30,245	84,956	83,448	104,411
Australia	16.8	16.1	63,067	75,584	51,462	115,048	127,730	122,549
Japan	68.2	68.5	36,175	31,996	25,740	66,928	47,484	40,262
United States	33.1	33.8	311,888	326,741	304,082	635,108	553,740	524,688
United Kingdom	12.2	12.8	55,251	34,132	26,536	117,310	85,894	61,174

Source: World Bank Indicators

DEFINITIONS

The definitions and classifications used in the National R&D Survey 2010 and in this Handbook are based on the *International Standardization of Statistics on Science and Technology* (UNESCO, 2010) and the *Frascati Manual* (OECD, 2002).

1. Research and Experimental Development (R&D)

Comprises creative work undertaken on a systematic basis in order to increase the stock knowledge including the knowledge of humanity, culture and society, and the use of this stock knowledge to device new applications. The term R&D covers three activities: basic research, applied research and experimental development work.

Basic research : the experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations phenomena and observed facts, without any particular application or use in view.

Applied research: the original investigations undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

Experimental development : the systematic work, drawing on existing knowledge gained from research and practical experience that is directed to producing new materials, products and devices; to installing new processes, systems and services; or to improving substantially those already produced or installed.

2. Sectors

Government sector : includes all departments, offices and other bodies, which furnish but normally do not sell to the community, those common services.

Higher Education sector : includes all universities, colleges of technology and other institutions providing tertiary education, whatever their sources of funds or legal status.

Private sector : includes all firms, organizations and institutions whose primary activity is the market production of the goods or services (other than higher education) for sale to the general public at an economically significant price and to the private non profit institutions mainly serving them.

3. R&D Expenditures

R&D Expenditures : all expenditures for R&D performed within a sector of the economy, including both:

a. Current cost (labour cost, non capital purchases of materials, supplies of R&D equipments, water, fuel, gas, electricity, library materials etc.).

b. Capital expenditure (reported in full for the period when they took place and should not register as element of depreciation).

4. Human Resources in Research and Development

Science and Technology Personnel (STP) : It is defined according to the Canberra Manual (OECD) as persons fulfilling one of the following conditions:

- Successfully completed education at the tertiary level in a S&T field of study (seven broad S&T fields of study are Natural Sciences, Engineering and Technology, Medical Sciences, Agriculture Sciences, Social Sciences, Humanities and other fields).
- Not formally qualified as above but employed in an occupation where the above qualifications are normally required.
- Working in the above fields providing technical services or supporting services.

R&D Personnel : all persons employed directly on R&D, as well as those providing direct services such as R&D managers, administrators, and clerical staff excluding persons providing an indirect service such as canteen and security.

Researchers : professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned. Postgraduate students at the Ph.D. level engaged in R&D are also considered as researchers.

Technicians and equivalent staff : persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences (technicians) or social sciences and humanities (equivalent staff). They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods normally under the supervision of researchers.

Other supporting staff : includes skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with (or providing services to researchers involved in) such projects.

Headcount : reflects the total number of persons employed in R&D, independently from their dedication. These data allow links to be made with other data series, such as education and employment data or the results of population censuses. They are also used for calculating indicators, analyzing the characteristics of the R&D workforce, with respect to age, gender or national origin.

One Full-time equivalent : one person-year. (e.g. if a person normally spends 30% of his/her time on R&D and the rest on other activities such as teaching , administration and counseling, the FTE is then counted as 0.3). Similarly, if a full time R&D worker is employed at an R&D unit for only a six month period, the FTE is calculated as 0.5.

Innovation : the use of new or significantly improved production process, distribution method, or support activity for goods or services.

Survey Team - Science & Technology Policy Research Division (STPRD)

- Dr P.R.M.P Dilrukshi, Head–for overall coordination of the Survey including questionnaire preparation, data analysis, indicator development and preparation of the Handbook
- Mr Yohan Lakmal Silva and Mr Thanuja Senevirathne, Research Assistants – coordination of data collection, data entry and preparation of databases and data tables .
- Ms Udeshika Nanayakkara and Ms Hasani Rajapakshe, Research Assistants – for assisting data compilation and preparation of Handbook.
- Mrs Ajantha Kanthi, Management Assistant- for questionnaire and letter posting, maintain records on data collection, data entry and primary data table preparations
- Mrs Chandima Samarasinghe, Management Assistant – for graphic work of the Handbook and typesetting