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Technical Report

CARIBBEAN REGIONAL

(Antigua and Barbuda, Bahamas, Barbados, Belize, British Virgin Islands, Caymans, Dominica, Grenada, Guyana, Jamaica, Montserrat, Netherlands Antilles, St. Christopher-Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, and Turks and Caicos Islands)

Planning and Application of Science and Technology for Caribbean Development

Caribbean Scientific and Technological Potential (STP) Survey

by J.-C. Mba-Nzé

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Report prepared for the Governments of Antigua and Barbuda, Bahamas, Barbados, Belize, British Virgin Islands, Caymans, Dominica, Grenada, Guyana, Jamaica, Montserrat, Netherlands Antilles, St. Christopher-Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, and Turks and Caicos Islands, by the United Nations Educational, Scientific and Cultural Organization (Unesco) acting as Executing Agency for the United Nations Development Programme (UNDP)

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Abbreviations used in the report

S&T	-	Science and Technology
R&D	-	Research and Development
STS	-	Scientific and Technological Services
STET	-	Scientific and Technological Education and Training
SE	-	Scientists and Engineers
FTE	-	Full-time Equivalent
NIHERST	-	National Institute of Higher Education
NCST	-	National Council for Science and Technology
NSTC	-	National Science and Technology Council
STP	-	Scientific and Technological Potential
SRC	-	Scientific Research Council
T'T	-	Trinidad and Tobago

Summary

The following report constitutes the analysis of data relating to human resources and collected within the framework of projects UNDP/RLA/85/013 and RLA/87/024.

The first part describes the methods used for collecting data

The second part makes the comparative study between the 7 countries concerned with the project.

The third part analyses data relating to each country.

The fourth part deals with conclusions and recommendations.

Two annexes appear at the end; one gives the list of co-ordinators concerned with the project, the other contains the questionnaires used for collecting data.

RLA/87/024 - Planning and Application of Science and Technology for Caribbean Development

TECHNICAL REPORT

I. BACKGROUND

1. The following report constitutes the statistical analyses of the Caribbean STP data collected within the framework of project UNDP/RLA/85/013 and RLA/87/024, the primary aim of which is the "strengthening of science and technology in the Caribbean sub-region".

2. The preliminary preparatory activities of the Caribbean STP survey were carried out by a Unesco staff member from 27 October to 10 November 1985 (cf. report FMR/SC/STP/86/205 (UNDP), Paris 1986) A training seminar for national coordinators of the survey, conducted by a consultant and a Unesco staff member was held in Barbados in May 1986. The list of the coordinators appears in Appendix 1.

3. The national scientific and technological potential (STP) means all the organized resources which a country has at its sovereign disposal for the purpose of discovery and invention, and for the study of all the problems raised by the application of science and technology to development.

4. The STP survey provides an overall view of the resources of the national R&D and STS system existing within the scientific and technological institution of a country namely :

- human resources)
- financial resources (
- material resources (allocated to R&D
- information resources)

5. The data obtained in the national STP survey can be used to construct indicators to assess the status and the evolution of national scientific and technological development policy in a country. These indicators measure both STP development and STP structure.

6. Three questionnaires were used for the STP survey:

Questionnaire No. 1 on scientific and technological institution, to be completed by the heads of the institutions involved;

Questionnaire No. 2 on R&D projects and scientific and technological services (STS) activity to be completed by the principal person in charge of each R&D project or STS activity; Finally,

Questionnaire No. 3 on scientists and engineers to be completed by all full-time and part-time personnel (scientists and engineers) working in the institution.

7. The final form of the three questionnaires which appears in Appendix 2 was established after a pilot survey had been carried out on a few institutions in Barbados.

8. In each country, the survey was undertaken under the responsibility of the national coordinator. The reference year for the survey was 1986. It was recommended that the survey should be conducted by means of interviews. The interview method offers many advantages such as exhaustiveness of replies, the possibility of providing respondents with direct explanation on the questionnaire, which in consequence will be correctly and fully completed.

9. Ancillary documents and software for data entry and checking using a micro-computer were prepared by Unesco and distributed to national co-ordinators.

10. The distribution of the questionnaires received on diskettes by Unesco from co-ordinators is the following :

Type of questionnaire:	N°1	N°2	N°3
Country :			
Antigua and Barbuda	11	10	19
Barbados	13	27	40
Grenada	5	18	23
Jamaica	15	21	59
St-Vincent & Grenadines	12	13	26
Saint Lucia	12	12	24
Trinidad & Tobago	53	130	422
TOTAL	121	231	613

11. All the tables which appear in this report were drawn up by the senior clerk programmer of the Division of Science and Technology Policies, using the software HFDL 2.1 D (Host Forms Description Language) and the analysis was done using the ABC statistical software.

II. COMPARATIVE STUDY OF THE SCIENTIFIC AND TECHNOLOGICAL POTENTIAL OF THE 7 COUNTRIES IN THE CARIBBEAN

Socio-economic indicators

12. Table A gives the socio-economic indicators of the 7 countries surveyed. The surface area of Jamaica is larger than any of the other countries but its GNP is the lowest.

Personnel in the institutions surveyed

13. Table B gives the number of scientists and engineers, technicians and auxiliary personnel, the number of the institutions surveyed and the number of scientific and technological units in these institutions. Most of the institutions surveyed are located in Trinidad and Tobago (43.8 % of the total) which also regroups 38 % of scientists/engineers, 49.7 % of technicians, 39.9 % of auxiliary personnel, 65 % of S&T units). Antigua and Grenada regroup less personnel than any of the other countries.

Personnel per status of the institutions

14. Table C gives the distribution of the personnel according to the status of the institutions. Governmental sector regroups 38.4 % of scientists/engineers, 54.9 % of technicians, 52.1 % of auxiliary personnel. The semi-governmental sector regroups 22 % of scientists/engineers, 21.4 % of technicians, 22.3 % of auxiliary personnel. The private sector regroups 39.6 % of scientists/engineers, 23.7 % of technicians, and 25.6 % of auxiliary personnel. Note that Barbados did not provide any data for the semi-governmental sector. The same remark applies to Grenada for the private sector.

Percentage of time spent in administrative tasks

15. Table D gives for each country the percentage of scientists/engineers who spent more than 50 % or less than 25 % of their time in administrative tasks. Among the scientists/engineers who replied to questionnaire N° 3, Jamaica (20.3 %), Trinidad & Tobago (17.7 %), St. Lucia (16.7 %) are the countries where more than 15 % of scientists/engineers spend more than 50 % of their time on administrative tasks while St. Vincent and the Grenadines (73 %), and Barbados (70 %) are the countries where more than 70 % of scientists/engineers spend less than 25 % of their time on administrative tasks.

16. When the scientists/engineers spend more than 50 % of their time on administrative tasks, it can mean that they are not helped enough as regards administrative tasks or that they have not enough means to perform scientific and technological activities.

Distribution of scientists/engineers by age group and sex

17. Table E gives the distribution of scientists/engineers by age group, sex and country. Scientists/engineers who are 30-39 years old represent 39.8 % of scientists/engineers in the region. 43.9 % of the female scientists belong to that age-group. No woman of more than 60 years has been recorded. Note that among the 613 scientists/engineers who replied to questionnaire N° 3, 322 of them (52.5 %) are from Trinidad & Tobago.

Distribution of scientists/engineers by nationality, sex and sector of performance

18. Table F shows that among the 613 scientists/engineers who replied to questionnaire N° 3, 343 of them (55.95 %) belong to general service while 178 (29 %) of them belong to unspecified sector. The production and the higher education sectors regroup only 7.5 % each.

19. No scientist/engineer was recorded in the production sector for Antigua, Grenada, Jamaica and St. Lucia. No scientist/engineer was recorded in higher education for Antigua, St. Lucia and St. Vincent and the Grenadines.

Distribution of scientists/engineers according to their field of employment and sex

20. Table G shows that most of the scientists/engineers (370) are employed in applied sciences (61.5 %) while only 4.2 % are employed in exact sciences, 17.5 % in social sciences and 16.8 % in natural sciences.

21. 52.9 % of women are employed in applied sciences, 28.5 % of them are employed in social sciences, while 65 % of men are employed in applied sciences, 18.2 % in natural sciences and 13 % in social sciences. Note that, except for Trinidad and Tobago, no woman was employed in exact sciences.

Distribution of scientists/engineers according to the discipline of their last diploma

22. Table H shows the distribution of scientists/engineers who replied to questionnaire N° 3 according to their last diploma. 56.8 % of them have a diploma in applied sciences, 19.3 % in natural sciences, 19.4 % in social sciences and 4.5 % in exact sciences. The distribution of scientists according to their diploma seems to be aligned to the distribution according to the employment.

TABLE A

(*) Source: World Bank report, 1988

SOCIO-ECONOMIC INDICATORS (*) / COUNTRY	SURFACE (km^2)	POPULATION (inhabitants)	GNP PER INHABITANT ($ USD)
ANTIGUA	442	81.000	2,380
BARBADOS	431	254.000	5,150
GRENADA	344	98.000	1,240
JAMAICA	11.000	2.400.000	840
ST LUCIA	616	140.000	1,320
ST VINCENT & GRENADINES	388	119.000	960
TRINIDAD & TOBAGO	5.000	1.200.000	5,360

TABLE B

NUMBER / COUNTRY	Scientists/Engineers (FTE)	Technicians (FTE)	Auxiliary Personnel	Institutions	Units
ANTIGUA	35	55	290	11	18
BARBADOS	139	86	88	13	18
GRENADA	33	55	97	5	5
JAMAICA	936	371	668	15	17
ST LUCIA	52	140	79	12	21
ST VINCENT & GRENADINES	57	187	881	12	13
TRINIDAD & TOBAGO	768	876	1.397	53	172
TOTAL	2.020	1.770	3.500	121	264

TABLE C

NUMBER / COUNTRY	Scientists/Engineers (FTE)			Technicians (FTE)			Auxiliary Personnel		
	Governmental	Semigovernmental	Private	Governmental	Semigovernmental	Private	Governmental	Semigovernmental	Private
ANTIGUA	24	6	5	45	6	4	265	15	10
BARBADOS	129	-	10	70	-	16	78	-	10
GRENADA	30	3	-	55	-	-	93	4	-
JAMAICA	218	65	653	131	50	190	112	65	491
ST LUCIA	29	13	10	129	8	3	17	54	8
ST VINCENT & GRENADINES	24	26	7	127	47	13	443	189	249
TRINIDAD & TOBAGO	323	329	116	414	268	194	814	454	129
TOTAL	777	442	801	971	379	420	1.822	781	897
	2.020			1.770			3.500		

TABLE D

PERCENTAGE OF Scientists/Engineers COUNTRY	Spend more than 50 % of their time in administrative tasks	Spend less than 25 % of their time in administrative tasks
ANTIGUA	10.5 %	57.8 %
BARBADOS	12.5 %	70 %
GRENADA	4.3 %	65.2 %
JAMAICA	20.3 %	62.7 %
ST LUCIA	16.7 %	62.5 %
ST VINCENT & GRENADINES	7.7 %	73 %
TRINIDAD & TOBAGO	17.7 %	64.9 %

TABLE E

AGE-GROUP / SEX / COUNTRY	Up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
ANTIGUA	3	2	6	2	4	-	1	-	1	-	15	4
BARBADOS	4	1	10	3	14	1	3	-	4	-	35	5
GRENADA	3	-	5	3	2	-	2	-	8	-	20	3
JAMAICA	10	7	16	5	11	3	2	4	1	-	40	19
ST LUCIA	3	1	13	1	-	-	4	1	1	-	21	3
ST VINCENT & GRENADINES	10	4	9	2	1	-	-	-	-	-	20	6
TRINIDAD & TOBAGO	50	38	109	60	86	24	38	11	6	-	289	133
TOTAL	83	53	168	76	118	28	50	16	21	-	440	173
	136		244		146		66		21		613	

TABLE F

SECTOR / Nationality / COUNTRY	HIGHER EDUCATION		GENERAL SERVICE		PRODUCTION		UNSPECIFIED		TOTAL	
	National	Foreigners	National	Foreigners	National	Foreigners	National	Foreigners	National	Foreigners
ANTIGUA	-	-	1	3	-	-	11	4	12	7
BARBADOS	9	1	17	3	2	-	8	-	36	4
GRENADA	3	-	18	2	-	-	-	-	21	2
JAMAICA	7	8	31	13	-	-	-	-	38	21
ST LUCIA	-	-	11	5	-	-	3	5	14	10
ST VINCENT & GRENADINES	-	-	24	-	2	-	-	-	26	-
TRINIDAD & TOBAGO	8	10	203	12	34	8	138	9	383	39
TOTAL	27	19	305	38	38	8	160	18	530	83
	46		343		46		178		613	

TABLE G

EMPLOYMENT

FIELD AND SEX / COUNTRY	EXACT SCIENCES		NATURAL SCIENCES		APPLIED SCIENCES		SOCIAL AND HUMAN SCIENCES		TOTAL	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
ANTIGUA	-	-	4	-	10	3	1	1	15	4
BARBADOS	-	-	12	3	22	2	1	-	35	5
GRENADA	-	-	2	-	9	3	1	-	12	3
JAMAICA	4	-	16	10	19	7	1	2	40	19
ST LUCIA	-	-	6	-	10	2	5	1	21	3
ST VINCENT & GRENADINES	-	-	-	-	18	5	-	-	18	5
TRINIDAD & TOBAGO	12	9	38	10	191	69	47	45	288	133
TOTAL	16	9	78	23	279	91	56	49	429	172
	25		101		370		105		601	

TABLE H

TRAINING

FIELD AND SEX / COUNTRY	EXACT SCIENCES		NATURAL SCIENCES		APPLIED SCIENCES		SOCIAL AND HUMAN SCIENCES		TOTAL	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
ANTIGUA	-	-	6	1	7	2	1	1	14	4
BARBADOS	-	-	14	4	18	1	3	-	35	5
GRENADA	1	-	4	1	7	2	1	-	13	3
JAMAICA	4	1	15	11	19	6	2	1	40	19
ST LUCIA	-	-	8	-	8	2	4	2	20	4
ST VINCENT & GRENADINES	-	-	-	-	15	3	-	-	15	3
TRINIDAD & TOBAGO	13	8	37	14	185	64	54	47	289	133
TOTAL	18	9	84	31	259	80	65	51	426	171
	27		115		339		116		597	

III. STATISTICAL ANALYSES OF STP DATA BY COUNTRY

ANTIGUA AND BARBUDA

23. Socio-economic indicators are as follows :*

Surface	442 km2
Population	81.000 inhabitants
GNP per inhabitant (1986)	2.380 US$

National S&T capabilities

24. No national science and technology policy-making body has been set-up, but advice is sought on an ad hoc basis as required from time to time from appropriate Government Departments. The Antigua and Barbuda Government is an Associate Member of the Caribbean Council for Science and Technology.

Rate of answers to the questionnaires

25. Eleven institutions answered Questionnaire No.1. Among them :

1 was an institution of higher education
1 was a natural research centre
1 was an institution not integrated with production
8 were of unspecified type.

As for their status, 4 were governmental ; 3 semi-governmental and 4 were private.

26. Nine R&D projects and 1 STS activity were recorded. Nineteen scientists/engineers replied to Questionnaire No.3 (27,7% of the total recorded at institution level).

Number of personnel in R&D and STS system (scientists/engineers, technicians and auxiliary personnel)

27. Table 1 shows that most of personnel are regrouped in institutions of unspecified types (85.7% of scientists/engineers, 88.9% of technicians, 93.4% of auxiliary personnel) the remainder are regrouped in institutions not integrated in production. The ratio A is equal to 1; it means that no part-time scientist/engineers are employed. The ratio B is equal to 1.5, this means that there are 3 technicians for 2 scientists. Auxiliary personnel (ratio C) are more employed in the institutions of unspecified types. Apparently no scientist/engineers and technicians have been recorded in higher educational institutions and in research centres closely linked to universities.

* Origin : World Bank report 1988

28. Table 2 shows that 68.5% of scientists/engineers, 83.3% of technicians, and 91.3% of auxiliary personnel belong to the governmental sector. The distribution of personnel in the semi-governmental sector and in the private sector are perceptibly the same. The ratio B is equal to 2 in the governmental sector and 1 in the others

Number of S&T units and average number of scientific workers and technicians

29. Table 3 shows that 18 units were recorded in the 11 institutions surveyed. Ratios D and E give the number of scientists/engineers and technicians per unit. For the whole country the average is 2 scientists and 3 technicians per unit. Note that no data were recorded in universities and research centres linked to them.

Number of R&D projects and average number of scientists/engineers and technicians per R&D project by type of institution

30. Table 4 provides the distribution of personnel assigned to R&D projects. The ratio F (number of technician per researcher) is better in institutions not integrated in production (approximately 1 technician/researcher).

Distribution of scientists/engineers by type of activities in which they are engaged

31. Table 5 shows that the 18 scientists/engineers who replied to questionnaire number 3 are all involved in STS activities. Among 11 of them involved in R&D, 10 are also dealing with STS and 10 with STET. Among those involved in STS, 15 are dealing also with STET. The ratios J, K and L are approximately equal to 1. It means that scientists/engineers involved in R&D, are also involved in STS and STET.

Total number of scientists/engineers by major discipline of their initial training and current employment

32. Table 6 shows that among the 19 scientists/engineers who replied to questionnaire number 3, 21% are employed in natural sciences, 68.4% in applied sciences and 10.5% in social and human sciences. No woman was recorded in natural sciences. 23.1% of scientists/engineers employed in applied sciences are women who represent 50% of scientists/engineers employed in social sciences. Note that no scientists/engineers were recorded in exact sciences.

33. Table 7 shows that among the 18 scientists/engineers who replied to questionnaire number 3, 38.8 % were trained in natural sciences, 50% in applied science and 11.1% in social sciences.

34. The ratio $\frac{\text{Total training}}{\text{Total employment}}$ is more than 1 in natural sciences and social and human sciences, but less than 1 for applied sciences. Women represent 14.3% of persons trained in natural sciences, 22.2% in applied sciences, 50% in social sciences. Nobody trained in exact sciences replied to the questionnaires.

Distribution of scientific researchers by percentage of time spent in R&D, STS, STET, purely administrative tasks and other activities

35. Table 8 gives the number of scientific researchers distributed according to the percentage of time spent in different activities. Among 19 researchers who replied to questionnaire number 3, only 3 of them (16%) spent more than 50% of their time in R&D and 5 (26%) more than 50% of their time in STS. 2 of them (10%) spend more than 50% of their time in administrative tasks ; 8 of them (42%) are not involved in R&D and 9 of them (47%) are not involved in other activities. 3 of them (16%) are not engaged in training.

Distribution of scientific researchers by age-group, nationality and sex

36. Table 9 shows that 63.2% of researchers who replied to questionnaire number 3 are national. Women represent 21% of the total. Among national researchers, women represent 25% and among the foreigners, they represent 14.3%. 40% of all researchers, under 30 years of age are women, who also represent 25% of researchers between 30 and 39 years of age. No woman over 40 years of age has been recorded. 70% of the men and 75% of the women are national.

Distribution of scientific researchers by sex, type of institution and nationality

37. Table 10 shows that the general service sector employs more foreigners (75%) than the other sectors of performance ; the average for the whole country is 36.8%

Scientific researchers by type of institution and age groups

38. Table 11 shows that the scientific researcher who is more than 60 years old belongs to a national research centre and is a national according to table 9. 89.5% of the researchers are less than 50 years old.

ANTIGUA : TABLE 1

Sector of Performance	Staff engaged on S&T activities Type of institution	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
							2/1	3/1	4/2	5/(1+3)
		Full Time	FTE	Full Time	FTE	Total				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	4	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	2	2	4	-	-	-	2
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	5	5	4	4	11	1	0.8	0.8	1.2
SUB-TOTAL B		5	5	6	6	15	1	1.2	1.2	1.4
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	30	30	48	49	271	1	1.6	1.6	3.5
TOTAL A+B+C+D		35	35	54	55	290	1	1.5	1.6	3.3

ANTIGUA : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	24	24	45	45	265	1	1.9	1.9	3.8
2. SEMI-GOVERNMENTAL	6	6	5	6	15	1	0.8	1	1.4
3. PRIVATE	5	5	4	4	10	1	0.8	0.8	1.1
TOTAL	35	35	54	55	290	1	1.5	1.6	3.3

ANTIGUA : TABLE 3

Sector of Performance	Type of institution	Total Number	Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
			Scientific workers (SE)		Technicians			1/5	2/5	3/5	4/5
			Full Time	FTE	Full Time	FTE					
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	2	2	1	-	-	2	0.5	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	5	5	4	4	2	2.5	2.5	2	2	
SUB-TOTAL B			5	5	6	6	3	1.7	1.7	2	2
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	30	30	48	49	15	2	2	3.2	3.3	
TOTAL A+B+C+D		35	35	54	55	18	1.9	1.9	3	3.1	

ANTIGUA : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel					
			FTE	FTE	FTE					
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	-	-	-	-	-	-	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	7	5	9	4	0.7	1.8	1.3	2.3	
SUB-TOTAL B		7	5	9	4	0.7	1.8	1.3	2.3	
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	49	10	26	5	0.2	9.8	2	5.2	
TOTAL A+B+C+D		56	15	35	9	0.3	6.2	1.7	3.9	

ANTIGUA : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
			R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
			Total	Total	Total	Total	Total	4/1	3/1	5/2
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	1	1	1	-	-	-	1	-	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	3	3	3	3	3	1	1	1	
SUB-TOTAL B		4	4	4	3	3	0.75	1	0.75	
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	
D. Unspecified	6. Unspecified types	7	14	6	7	12	1	0.9	0.9	
TOTAL A+B+C+D		11	18	10	10	15	0.9	0.9	0.8	

ANTIGUA : TABLE 6

(EMPLOYMENT)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	-	-	-	-	
	12. Mathematics	-	-	-	-	-
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics	-	-	-	-	-
	22. Physics	1	-	1	5.3 %	-
	23. Chemistry	-	-	-	-	-
	24. Life Sciences	1	-	1	5.3 %	-
	25. Earth and Space Sciences	2	-	2	10.5 %	-
	SUB-TOTAL	4	-	4	21.1 %	-
Applied Sciences	31. Agricultural and Veterinary Sciences	7	1	8	42.1 %	0.13
	32. Medical Sciences	-	2	2	10.5 %	0.25
	33. Technological Sciences	3	-	3	15.8 %	-
	SUB-TOTAL	10	3	13	68.4 %	0.23
Social and Human Sciences	51. Anthropology	1	-	1	5.3 %	-
	52. Demography					
	53. Economic Sciences					
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters	-	1	1	5.3 %	1
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	1	2	10.5 %	0.5
	TOTAL	15	4	19	100 %	0.21

ANTIGUA : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
	1	1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL	-	-	-	-	-
Natural Sciences	21. Astronomy and Astrophysics	-	-	-	-	
	22. Physics	1	-	1	5.5 %	-
	23. Chemistry	-	-	-	-	-
	24. Life Sciences	2	-	2	11.1 %	-
	25. Earth and Space Sciences	3	1	4	22.2 %	0.25
	SUB-TOTAL	6	1	7	38.8 %	0.14
Applied Sciences	31. Agricultural and Veterinary Sciences	4	1	5	27.8 %	0.20
	32. Medical Sciences	1	1	2	11.1 %	0.50
	33. Technological Sciences	2	-	2	11.1 %	-
	SUB-TOTAL	7	2	9	50.0 %	0.22
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences	1	-	1	5.5 %	-
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology	-	1	1	5.5 %	0.50
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	1	2	11.1 %	0.50
	TOTAL	14	4	18	100 %	0.22

ANTIGUA : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	8	3	5	2	1
STS activities	1	7	6	1	4
STET activities	3	14	2	-	-
Purely administrative tasks	5	6	6	2	-
Other activities	9	7	2	1	-

ANTIGUA : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	3	-	3	3	1	3	1	-	1	-	15	9	75 %	6	86 %
Women	2	-	1	1	-	-	-	-	-	-	4	3	25 %	1	14 %
Total	5	-	4	4	1	3	1	-	1	-	19	12	100 %	7	100 %
% Women	40 %	-	25 %	25 %	-	-	-	-	-	-	21.1 %	25 %	-	14.3 %	-

ANTIGUA : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	1	-	-	-	1	1	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	-	-	2	1	3	-	3
SUB-TOTAL B		1	-	2	1	4	1	3
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	8	3	4	-	15	11	4
TOTAL A+B+C+D		9	3	6	1	19	12	7

ANTIGUA : TABLE 11

Sector of Performance	Age group / Type of institution	up to 29 years old	30 to 39	40 to 49	50 to 59	60 and over	TOTAL
		Total	Total	Total	Total	Total	
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	1	1
	3. Institutions attached to academies of sciences and/or national research centres.	-	1	2	-	-	3
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.						
SUB-TOTAL B		-	1	2	-	1	4
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	5	7	2	1	0	15
TOTAL A+B+C+D		5	8	2	1	1	19

BARBADOS

39. The Socio-economic indicators for Barbados are as follows:*

Surface	431 km2
Population	254.000 inhabitants
GNP per inhabitant (1986)	5.150 USD

National S&T capabilities

40. Under the Ministry of Finance and Planning was set up, in 1977, the National Council for Science and Technology (NCST) with the following main functions :

- to co-ordinate R&D in Science and Technology
- to advise any Minister on S&T matters.

Rate of answers to the questionnaires

41. Thirteen institutions answered Questionnaire No.1 among them :

- 2 were universities or similar institutions of higher education
- 1 was a research centre linked with universities
- 1 was a national research centre
- 7 were institutions not integrated with production
- 1 was an R&D laboratory
- 1 was of unspecified type

As for their status :

- 9 were governmental
- 1 was semi-governmental
- 3 were private.

22 R&D projects and 5 STS activities were recorded.

Forty scientists/engineers completed Questionnaire No.3 (31.5% of the total recorded at the institution level).

* Origin : World Bank Report 1988

Number of personnel in the R&D and STS system (scientists and engineers, technicians and auxiliary personnel)

42. Table 1 shows that the general service regroups most of the personnel (57.5% of scientists and engineers, 49.4% of technicians, 54.5% of auxiliary personnel). The higher education sector regroups 15% of scientists and engineers, 10.1% of technicians, 36.5% of auxiliary personnel. For the production sector, these percentages are respectively 3%, 17.7%, 4.5%. The remainder belongs to institutions of unspecified types (24.5% of scientists, 22.8% of technicians, 4.5% of auxiliary personnel). Ratio A is equal to 3 in national research centres which employ most of the part-time scientists/engineers. Part-time personnel are less employed in the other types of institutions. Ratio B is higher in the production sector: 3 technicians per scientist/engineer. In the other sectors, there is 1 technician per 2 scientist/engineers - Auxiliary personnel (ratio C) are more employed in universities and national research centres : 1 auxiliary personnel per scientist/engineer.

43. Table 2 shows that 92% of scientists/engineers belong to the governmental sector which also regroups 79.7% of technicians and 88.6% of auxiliary personnel. Few part-time personnel are employed (ratio A = 1). In the governmental sector there is 1 technician per 2 scientists/engineers while in the private sector there are 3 technicians per 2 scientists/engineers. Note that no data was recorded at the semi-governmental sector.

Number of S&T units and average number of scientific workers and technicians

44. In the 13 institutions surveyed, 18 units were recorded, 5 in the universities and 13 in the institutions not integrated with production. In the universities, the size of the units is 4 scientists/engineers and 2 technicians, while in the institution not integrated with production, there are 14 scientists/engineers and 7 technicians per unit. The average for the whole country is 8 scientists and 5 technicians per unit. Note that in the other institutions, no unit was recorded (perhaps because the institution is a unit itself).

Number of R&D projects and average number of scientists/engineers and technicians by R&D projects, by type of institution

45. Table 4 provides the distribution of personnel assigned to R&D projects. Ratio F reveals the technical support supplied to researchers participating in R&D; it is better in projects undertaken in universities (2 technicians per researcher). The ratios G, H and I give respectively the number of researchers, technicians and auxiliary personnel per project. Their averages for the whole country are respectively 3.6, 1.3 and 1.4. Note that 21 researchers in national research centres are dealing with one project.

Distribution of scientists/engineers (SE) by type of activities on which they are engaged

Research and Development (R&D)
Scientific and Technological Services (STS)
Scientific and technological education and training (STET)

46. Table 5; the ratios J, K, L are equal to 1 in universities and research centres linked to universities. That means that in universities SE involved in R&D, R&D and STET are also involved in STS, SE involved in STS are also involved in STS and STET. In the institutions not integrated with production, among 12 scientists involved in R&D, 10 are dealing with STS and 4 with STET. Among 16 scientists involved in STS, 7 are dealing with STET. For the whole country, the averages of ratios J, K and L are respectively 0.5, 0.85 and 0.34.

Total number of scientists/engineers by major discipline of their initial training and current employment

47. Table 6 gives the distribution of SE according to the discipline of their employment. Table 7 gives the distribution according to their initial training. Table 6 shows that 37.5% of scientists are employed in natural sciences, 60% in applied sciences and 2.5% in social and human sciences. 14% of scientists/engineers are women. Among scientists/engineers employed in natural sciences, 25% are women. In applied sciences, women represent only 9%.

48. Table 7 shows that 45% of scientists and engineers have been trained in natural sciences, 47.5% in applied sciences and 7.5% in social and human sciences. The ratio $\frac{\text{Total training}}{\text{Total employment}}$ is more than 1 for natural

sciences and social and human sciences but is less than 1 for applied sciences.

Distribution of scientific researchers by percentage of time spent in R&D, STS activities, purely administrative tasks and other activities

49. This analysis in Table 8 gives an idea of the activity which takes up most of the time of the SE. Among 40 researchers who replied to Questionnaire No 3, 7 (17.5%) spend more than 50% of their time in R&D (idem for STS), 14 (35%) spend more than 50% of their time in training; 5 (12.5%) spend more than 50% of their time in administrative tasks, 20 of them (50%) do not carry out R&D activities.

Distribution of scientific researchers by age-group, nationality and sex

50. Table 9 shows that among the researchers, 51% of men and 80% of women are Barbadians. For the whole country, 10% of researchers are foreigners. No woman over 49 years of age has been recorded. Only 7 researchers (17.5%) are more than 50 years old. 12.5% of researchers are women. Percentages of women among the national researchers are the following :

20% of researchers are less than 30 years old
18% are between 30 years and 39 years old
7% are between 40 years and 49 years old.

Distribution of scientific researchers by sex, type of institutions and nationality

51. Table 10 shows that only universities and institutions not integrated with production employ foreigners respectively 20% and 17% of researchers of these institutions. The general service sector employs 50% of SE, the universities 25%, the sector of production 5%. 20% of researchers belong to the unspecified sector.

Scientific researchers by type of institution and age-group

52. Table 11 shows that 82.5% of scientific researchers are less than 50 years old. No researcher under 30 or more than 59 years old has been recorded in universities. It can be noted that the Barbadian researchers are relatively young.

BARBADOS : TABLE I

Sector of Performance	Staff engaged on S&T activities Type of institution	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
							2/1	3/1	4/2	5/(1+3)
		Full Time	FTE	Full Time	FTE	Total				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	19	24	8	8	32	1.3	0.5	0.3	1.2
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	4	4	2	2	6	1	0.5	0.5	1
	3. Institutions attached to academies of sciences and/or national research centres.	1	3	-	-	1	3	-	-	1
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	68	68	37	37	41	1	0.5	0.5	0.4
SUB-TOTAL B		73	75	39	39	48	1	0.5	0.5	0.4
C. Production	5. R&D laboratories integrated with production	4	4	14	14	4	1	3.5	3.5	0.2
D. Unspecified	6. Unspecified types	31	36	18	25	4	1	0.6	0.7	0.08
TOTAL A+B+C+D		127	139	79	86	88	1.1	0.6	0.6	0.4

BARBADOS : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	117	129	63	70	78	1.1	0.5	0.5	0.4
2. SEMI-GOVERNMENTAL	-	-	-	-	-	-	-	-	-
3. PRIVATE	10	10	16	16	10	1	1.6	1.6	0.4
TOTAL	127	139	79	86	88	1.1	0.6	0.6	0.4

BARBADOS : TABLE 3

Sector of Performance	Type of institution	Total Number	Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
			Scientific workers (SE)		Technicians			1/5	2/5	3/5	4/5
			Full Time	FTE	Full Time	FTE					
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	19	24	8	8	5	3.8	4.8	1.6	1.6
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	4	4	2	2	1	4	4	2	2
	3. Institutions attached to academies of sciences and/or national research centres.	1	3	-	-	1	1	3	-	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	68	68	37	37	13	13.6	13.6	7.4	7.4
SUB-TOTAL B			73	75	39	39	15	4.9	5	2.6	2.6
C. Production	5. R&D laboratories integrated with production		4	4	14	14	1	4	4	14	14
D. Unspecified	6. Unspecified types		31	36	18	25	1	31	36	18	25
TOTAL A+B+C+D			127	139	79	86	22	5.8	6.3	3.6	3.9

ANTIGUA : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel		2/1	1/4	2/4	3/4
			FTE	FTE	FTE					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions	1	2	1	-	2	-	-	-	
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	29	-	8	3	-	9.7	-	2.7	
	3. Institutions attached to academies of sciences and/or national research centres.	21	-	-	1	21	-	-	-	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	24	25	28	14	1	1.7	1.8	2	
SUB-TOTAL B		74	25	36	18	0.4	4.1	1.4	2	
C. Production	5. R&D laboratories integrated with production	1	1	-	1	1	1	1	-	
D. Unspecified	6. Unspecified types	4	-	1	3	-	1.3	-	0.3	
TOTAL A+B+C+D		80	28	30	22	0.4	3.6	1.3	1.4	

BARBADOS : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
		R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions	4	7	4	4	7	1	1	1
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	1	1	1	1	1	1	1	1
	3. Institutions attached to academies of sciences and/or national research centres.	1	1	1	-	-	-	1	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	12	16	10	4	7	0.3	0.8	0.6
SUB-TOTAL B		14	18	12	5	8	0.4	0.9	0.7
C. Production	5. R&D laboratories integrated with production	1	2	1	-	-	-	1	-
D. Unspecified	6. Unspecified types	1	2	-	1	2	1	-	1
TOTAL A+B+C+D		20	29	17	10	17	0.5	0.9	0.3

BARBADOS : TABLE 6

(EMPLOYMENT)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL	-	-	-	-	-
Natural Sciences	21. Astronomy and Astrophysics	-	-	-	-	
	22. Physics	2	-	2	5 %	-
	23. Chemistry	3	-	3	7.5 %	-
	24. Life Sciences	1	-	1	2.5 %	-
	25. Earth and Space Sciences	6	3	9	22.5 %	0.5
	SUB-TOTAL	12	3	15	37.5 %	0.25
Applied Sciences	31. Agricultural and Veterinary Sciences	4	2	6	15 %	0.5
	32. Medical Sciences	4	-	4	10 %	-
	33. Technological Sciences	14	-	14	35 %	-
	SUB-TOTAL	22	2	24	60 %	0.09
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy	1	-	1	2.5 %	-
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	-	1	2.5 %	-
	TOTAL	35	5	40	100 %	0.14

BARBADOS : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
	1	1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics	-	-	-	-	-
	22. Physics	3	-	3	7.5 %	-
	23. Chemistry	1	-	1	2.5 %	-
	24. Life Sciences	5	1	6	15 %	0.2
	25. Earth and Space Sciences	5	3	8	20 %	0.4
	SUB-TOTAL	14	4	18	45 %	0.2
Applied Sciences	31. Agricultural and Veterinary Sciences	4	1	5	12.5 %	0.2
	32. Medical Sciences	4	-	4	10 %	-
	33. Technological Sciences	10	-	10	25 %	-
	SUB-TOTAL	18	1	19	47.5 %	0.5
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy	3	-	3	7.5 %	-
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	3	-	3	7.5 %	-
	TOTAL	35	5	40	100 %	0.1

BARBADOS : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	20	7	6	3	4
STS activities	11	16	6	7	-
STET activities	13	9	4	8	6
Purely administrative tasks	7	19	7	4	1
Other activities	23	13	2	2	-

BARBADOS : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	4	0	9	1	13	1	3	-	3	1	35	32	88.9 %	3	75 %
Women	1	-	2	1	1	-	-	-	-	-	5	4	11.1 %	1	25 %
Total	5	-	11	2	14	1	3	-	3	1	40	36	100	4	100
% Women	20 %	-	18 %	50 %	7 %	-	-	-	-	-	12.5 %	11 %		25 %	

BARBADOS : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions	8	1	-	1	10	9	1
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	1	-	-	-	1	1	-
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	1	-	1	-	1
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	13	3	2	-	18	16	2
SUB-TOTAL B		14	3	3	-	20	17	3
C. Production	5. R&D laboratories integrated with production	2	-	-	-	2	2	-
D. Unspecified	6. Unspecified types	8	-	-	-	8	8	-
TOTAL A+B+C+D		32	4	3	1	40	36	4

BARBADOS : TABLE 11

Sector of Performance	Age group / Type of institution	up to 29 years old Total	30 to 39 Total	40 to 49 Total	50 to 59 Total	60 and over Total	TOTAL
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions	-	4	4	2	-	10
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	1	-	-	-	1
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	-	-	1	1
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	5	5	6	-	2	18
SUB-TOTAL B		5	6	6	-	3	20
C. Production	5. R&D laboratories integrated with production	-	1	1	-	-	2
D. Unspecified	6. Unspecified types	-	2	4	1	1	8
TOTAL A+B+C+D		5	13	15	3	4	40

GRENADA

53. The socio-economic indicators* for Grenada as follows:

Surface	344 Km^2
Population	98.000 inhabitants
GNP per inhabitant	1,240 US $

National S&T capabilities

54. A national science and technology policy-making body was first formed in 1978. It was reorganized into a National Science and Technology Council (NSTC) by law N° 28 of 1982, consisting of representatives of the various Ministries, Statutory bodies, Commodity boards, Academic disciplines and Professional, Industrial and Service Organizations elected from the National Assembly of Science and Technology.

Rate of answers to questionnaires

55. Five institutions completed Questionnaire No. 1, among them, one was a national research centre and 4 were institutions not integrated in production. 20 STS activities were recorded. 23 scientists/engineers replied to Questionnaire No. 3.

Number of personnel in R&D and STS system (scientists and engineers, technicians, auxiliary personnel)

56. Table 1 shows that most of the personnel are regrouped in the institutions not integrated with production (90.9 % of scientists/engineers, 100 % of technicians, 96 % of auxiliary personnel).

57. Table 2 shows that the same percentages apply to the governmental sector. No personnel of the private sector was recorded. Ratio A is equal to 1; it means that no part-time scientists are employed. Ratio B is approximately equal to 2 (2 technicians per scientist) and ratio C equals to 1.

Number of S&T units and average number of scientific workers and technicians

58. Table 3 shows that 5 S&T units were recorded. Ratio D gives the number of scientists/engineers per unit (in full time and in FTE). The average is 7 scientists/engineers per unit. Ratio E gives the number of technicians per unit (11 technicians per unit).

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* Origin: World Bank report, 1988.

Number of R&D projects and average number of personnel per R&D project

59. No R&D project was recorded during the survey (only 20 STS activities were recorded).

Distribution of scientists/engineers by type of activities on which they are engaged

60. In Table 5, the ratios J, K, L are equal to 1, it means that all scientists/engineers involved in R&D are also involved in STS and STET. In the national research centres, scientists/engineers involved in R&D or in STS are not dealing with STET.

Total number of scientists/engineers by major discipline of their initial training and current employment

61. Among the 23 scientists/engineers who replied to Questionnaire N° 3, 15 gave the discipline of their employment.

62. Table 6 shows that 80 % of them are employed in applied sciences, 13 % in natural sciences and 7 % in social sciences. Women are employed only in applied sciences.

63. Table 7 shows the distribution of scientists/engineers according to their disciplines of training. Among the 16 scientists who replied to Questionnaire N° 3, 56.25 % were trained in applied sciences, 31.25 % in natural sciences, 6.25 % in exact sciences and 6.25 % in social sciences. Women regroup 22 % of scientists trained in applied sciences and 20 % of scientists trained in natural sciences.

64. The ratio $\frac{\text{total training}}{\text{total employment}}$ is more than 1 for natural sciences and less than 1 for applied sciences.

Distribution of scientist researchers by percentage of time spent in R&D, STS activities purely administrative tasks and other activities

65. Among the 23 scientists/engineers who replied to Questionnaire N° 3, only 2 (8,5 %) spent more than 75 % of their time on R&D and 2 more than 75 % of their time on STS activities. Eleven of them (47,8 %) were not involved in R&D and 9 (39 %) in STS.

Distribution of scientific researchers by age-groups, nationality and sex

66. Table 9 shows that among the 23 scientists who replied to Questionnaire N° 3, 2 were foreigners (9 %). All the women recorded are under 40.

35 % of scientists are more than 60 years old,
9 % are between 50 years and 60 years old,
43 % are between 30 years and 50 years old,
17 % are less than 30 years old.

Women regroup 14 % of the scientists.

Distribution of scientific researchers by sex, type of institution and nationality

67. Table 10 shows that the 2 foreigners are employed in institutions not integrated in production which also employ the 3 women recorded. 90 % of the researchers belong to the general service sector.

Scientific researchers by type of institution and age-group

68. Table 11 gives the distribution of scientific researchers per age-group and per type of institution: 48 % of scientific researchers are under 40 and belong to the general service sector. Note that no scientist/engineer was recorded in the production sector.

GRENADA : TABLE 1

Sector of Performance	Staff engaged on S&T activities Type of institution	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
							2/1	3/1	4/2	5/(1+3)
		Full Time	FTE	Full Time	FTE	Total				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	3	3	-	-	4	1	-	-	1.3
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	30	30	55	55	93	1	1.8	1.8	1.1
SUB-TOTAL B		33	33	55	55	97	1	1.7	1.7	1.1
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	-	-	-	-	-	-	-	-	-
TOTAL A+B+C+D		33	33	55	55	97	1	1.7	1.7	1.1

GRENADA : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	30	30	55	55	93	1	1.8	1.8	1.1
2. SEMI-GOVERNMENTAL	3	3	-	-	4	1	-	-	1.3
3. PRIVATE	-	-	-	-	-	-	-	-	-
TOTAL	33	33	55	55	97	1	1.7	1.7	1.1

GRENADA : TABLE 3

Sector of Performance	Type of institution	Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
		Scientific workers (SE)		Technicians			1/5	2/5	3/5	4/5
		Total Number		Total number of personnel						
		Full Time	FTE	Full Time	FTE					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	-
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.	3	3	-	-	1	3	3	-	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	30	30	55	55	4	7.5	7.5	13.8	13.8
SUB-TOTAL B		33	33	55	55	5	6.6	6.6	11	11
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	-
D. Unspecified	6. Unspecified types	-	-	-	-	-	-	-	-	-
TOTAL A+B+C+D		33	33	55	55	5	6.6	6.6	11	11

GRENADA : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel		2/1	1/4	2/4	3/4
			FTE	FTE	FTE					
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.		No R&D project recorded							
SUB-TOTAL B										
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D										

GRENADA : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
			R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions	-	-	-	-	-	-	-	-	
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	-	-	-	-	-	-	-	
	3. Institutions attached to academies of sciences and/or national research centres.	4	3	3	-	-	-	0.75	-	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	8	10	8	8	9	1	1	0.9	
SUB-TOTAL B		12	13	11	8	9	0.7	0.9	0.7	
C. Production	5. R&D laboratories integrated with production	-	-	-	-	-	-	-	-	
D. Unspecified	6. Unspecified types	-	-	-	-	-	-	-	-	
TOTAL A+B+C+D		12	13	11	8	9	0.7	0.9	0.7	

GRENADA : TABLE 6

(EMPLOYMENT)

Discipline	Number of Personnel	Men	Women	Men and Women		Ratios
		Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	-	-	-	-	-
	12. Mathematics	-	-	-	-	-
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics	-	-	-	-	-
	22. Physics	-	-	-	-	-
	23. Chemistry	-	-	-	-	-
	24. Life Sciences	-	-	-	-	-
	25. Earth and Space Sciences	2	-	2	13.3	-
	SUB-TOTAL	2	-	2	13.3	-
Applied Sciences	31. Agricultural and Veterinary Sciences	5	1	6	40	0.17
	32. Medical Sciences	1	1	2	13.3	0.50
	33. Technological Sciences	3	1	4	26.7	0.25
	SUB-TOTAL	9	3	12	80	0.25
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences	1	-	1	6.7	-
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	-	1	6.7	-
	TOTAL	12	3	15	100	0.20

GRENADA : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	-	-	-	-	-
	12. Mathematics	1	-	1	6.25	-
	SUB-TOTAL	1	-	1	6.25	-
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry					
	24. Life Sciences					
	25. Earth and Space Sciences	4	1	5	31.25	0.20
	SUB-TOTAL	4	1	5	31.25	0.20
Applied Sciences	31. Agricultural and Veterinary Sciences	4	1	5	31.25	0.20
	32. Medical Sciences	-	-	-	-	-
	33. Technological Sciences	3	1	4	25	0.25
	SUB-TOTAL	3	2	9	56.25	0.22
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography	1	-	1	6.25	-
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	-	1	6.25	-
	TOTAL	13	3	16	100	0.19

GRENADA : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	11	4	5	1	2
STS activities	9	3	6	3	2
STET activities	14	8	1	-	-
Purely administrative tasks	11	4	7	1	-
Other activities	19	2	2	-	-

GRENADA : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
												Nat.		For.	
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		No.	%	No.	%
Men	3	-	4	1	1	1	2	-	8	-	20	18	86	2	100
Women	-	-	3	-	-	-	-	-	-	-	3	3	14	-	-
Total	3	-	7	1	1	1	2	-	8	-	23	21	100	2	100
% Women	-	-	43	-	-	-	-	-	-	-	13	14		-	

GRENADA : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions	3	-	-	-	3	1	2
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.							
	3. Institutions attached to academies of sciences and/or national research centres.	4	-	-	-	4	4	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	11	3	2	-	16	16	-
SUB-TOTAL B		15	3	2	-	20	20	-
C. Production	5. R&D laboratories integrated with production							
D. Unspecified	6. Unspecified types							
TOTAL A+B+C+D		18	3	2	-	23	21	2

GRENADA : TABLE II

Sector of Performance	Type of institution	Age group: up to 29 years old — Total	30 to 39 — Total	40 to 49 — Total	50 to 59 — Total	60 and over — Total	TOTAL
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions	1	-	-	-	2	3
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.						
	3. Institutions attached to academies of sciences and/or national research centres.	1	1	1	1	-	4
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	2	6	1	1	6	16
SUB-TOTAL B		3	7	2	2	6	20
C. Production	5. R&D laboratories integrated with production						
D. Unspecified	6. Unspecified types						
TOTAL A+B+C+D		4	7	2	2	8	23

J A M A I C A

69. The socio-economic indicators* for Jamaica are as follows:

Surface	11.000 km^2
Population	2.4 million inhabitants
GNP per inhabitant (1986)	840 US $

National S&T capabilities

70. The Government of Jamaica in 1960 passed an Act which established the Scientific Research Council (S.R.C.) to "undertake, foster, and co-ordinate Scientific Research on the island and to encourage the application of the results of such research to the exploitation and development of the resources of the island". S&T related policies are formulated in the areas of Health, Energy, Information, Food, Nutrition and Population.

Rate of answers to the questionnaires

71. Fifteen institutions replied to Questionnaire No. 1 among them: 3 were higher educational institutions and 12 were institutions not integrated in production. As for their status, 7 were governmental, 5 semi-governmental and 3 were private. 16 R&D projects and 5 S&T activities were concerned with Questionnaire No. 2 while 59 scientists/engineers replied to Questionnaire No. 3.

Number of personnel in the R&D and STS system
(Scientists/engineers, technicians and auxiliary personnel)

72. Table 1 shows that most of the personnel belong to the General Service sector (institutions not integrated in production) (55% of full time scientists, 85% of technicians, 78% of auxiliary personnel). That sector also employs most of the part-time personnel (Ratio A is more than 1).

73. Table 2 gives the distribution of the personnel according to the status of the institutions. Governmental institutions employ 49.8% of full-time scientists/engineers, 35% of technicians, and 16.8% of auxiliary personnel. Institutions in the private sector employ 35.7% of scientists/engineers, 51% of technicians and 73.5% of auxiliary personnel, part-time scientists/engineers are mostly employed in the private sector (ratio A = 4.3) ratio B gives the number of technicians per scientist/engineer (full-time and FTE). That ratio in full-time is better in the private sector (1.2) than in the governmental sector (0.6). The situation is similar as regards ratio C (number of auxiliary personnel per scientists and technicians.

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* Origin: World Bank report 1988

Number of S&T units and average number of scientist workers and technicians

74. Table 3 gives the distribution of personnel according to the number of units - Note that only 17 units were recorded in the 15 institutions surveyed. It seems that department or faculties were considered as S&T units when the basic statistical unit should be the smallest identifiable coherent cell. That is the reason why the size of these units is so big (from 17 to 64 scientists/engineers per unit and from 18 to 22 technicians per unit).

Number of R&D projects and average number of scientists/engineers and technicians per R&D project by type of institution

75. Table 4 provides the distribution of personnel assigned to projects. Ratio F gives the number of technicians per scientist/engineer (it is equal to 0.3 in higher educational institutions and 0.6 in R&D and STS institutions not integrated in production).

Distribution of scientists/engineers by type of activities on which they are engaged

76. Table 5 shows that among the 59 scientists/engineers who replied to Questionnaire No. 3, 45 are engaged in R&D, 37 in STS; among them, 28 are dealing with both R&D and STS, 33 with both R&D and STET, and 23 with both STS and STET. The ratios J and L are equal to 1 in the higher educational institutions; it means that all scientists/engineers engaged in R&D or in STS are also engaged in teaching (STET).

Total number of scientific workers by major discipline of their initial training and current employment

77. Table 6 shows that 44.1% of scientists/engineers are employed in natural sciences and the same percentage applies also to applied sciences; 6.7% are employed in exact science and 5.1% in social and human sciences. The ratio M gives the percentage of women for each discipline.

78. Table 7 gives the distribution of scientists/engineers according to their discipline of training. 44.1% were trained in natural sciences, 42.4% in applied sciences, 8.4% in exact sciences and 5.1% in social sciences.

79. The ratio $\frac{\text{Total training}}{\text{Total employment}}$ is equal to 1 for natural sciences and social sciences and more than 1 for applied sciences and exact sciences. When that ratio is more than 1 it means that more people are trained than the employment opportunities available.

Distribution of scientific researchers by percentage of time spent in R&D, STS, purely administrative tasks and other activities

80. Table 8 gives the number of scientists/engineers distributed according to the percentage of time spent on the different activities. Among the 59 who replied to Questionnaire No. 3, 14 did not carry out R&D, 22 did not carry out STS activities, 22 did not carry out training. Note that 22 spent more than 50% of their time on R&D.

Distribution of scientists/engineers by type of institution, sex and nationality

81. Table 10 shows that among the 59 scientists/engineers who replied to Questionnaire No. 3, 44 belonged to the general service (74.6%). 41% of scientists/engineers in the general service were women while they represent only 7% of scientists/engineers in higher educational institutions. The distribution of male foreigners was the same in higher educational institutions (7 out of 15) as in R&D and STS institutions not integrated in production (8 out of 15) - while one female foreigner was recorded in higher educational institutions and 5 in general service. Note that no female national was recorded in higher educational institutions.

Scientists/engineers by type of institution and age group

82. Table 11 shows that 35.6% of scientists/engineers who replied to Questionnaire No. 3 are 30 to 39 years old. There was no record of scientists who are more than 60 years old in higher educational institutions. 69.5% of scientists are under 50. Note that in higher educational institutions, 93% of scientists/engineers are under 50.

JAMAICA : TABLE 1

Sector of Performance / Type of institution	Staff engaged on S&T activities	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
							2/1	3/1	4/2	5/(1+3)
		Full Time	FTE	Full Time	FTE	Total				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	193	193	54	54	145	1	0.3	0.3	0.6
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	235	743	316	317	523	3.2	1.3	0.4	0.9
SUB-TOTAL B		428	936	370	371	668	2.2	0.9	0.4	0.8
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D		428	936	370	371	668	2.2	0.9	0.4	0.8

JAMAICA : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	213	218	130	131	112	1	0.6	0.6	0.3
2. SEMI-GOVERNMENTAL	62	65	50	50	65	1	0.8	0.8	0.6
3. PRIVATE	153	653	190	190	491	4.3	1.2	0.3	1.4
TOTAL	428	936	370	371	668	2.2	0.9	0.4	0.8

JAMAICA : TABLE 3

Sector of Performance	Type of institution	Total Number		Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
		Scientific workers (SE)		Technicians					1/5	2/5	3/5	4/5
		Full Time	FTE	Full Time	FTE							
		(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	193	193	54	54			3	64	64	18	18
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	235	743	316	317			14	16.8	53	22.6	22.6
SUB-TOTAL B		428	936	370	371			17	25	55	21.8	21.8
C. Production	5. R&D laboratories integrated with production											
D. Unspecified	6. Unspecified types											
TOTAL A+B+C+D		428	936	370	371			17	25	55	21.8	21.8

JAMAICA : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel		2/1	1/4	2/4	3/4
			FTE	FTE	FTE					
		(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions	14	4	6		2	0.3	7	2	3
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	31	19	47		14	0.6	2.2	1.4	3.4
SUB-TOTAL B		45	23	53		16	0.5	2.8	1.4	3.3
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D		45	23	53		16	0.5	2.8	1.4	3.3

JAMAICA : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
			R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions	12	8	7	12	8	1	0.6	1	
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	33	29	21	21	15	0.6	0.6	0.5	
SUB-TOTAL B		33	29	21	21	15	0.6	0.6	0.5	
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D		45	37	28	33	23	0.7	0.6	0.9	

JAMAICA : TABLE 6

(EMPLOYMENT)

	Number of Personnel Discipline	Men	Women	Men and Women		Ratios
		Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	-	-	-	-	-
	12. Mathematics	4	-	4	6.7	-
	SUB-TOTAL	4	-	4	6.7	-
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry	3	4	7	11.9	0.57
	24. Life Sciences	3	4	7	11.9	0.57
	25. Earth and Space Sciences	10	2	12	20.3	0.17
	SUB-TOTAL	16	10	26	44.1	0.38
Applied Sciences	31. Agricultural and Veterinary Sciences	3	-	3	5.1	-
	32. Medical Sciences	3	3	6	10.2	0.50
	33. Technological Sciences	13	4	17	28.8	0.24
	SUB-TOTAL	19	7	26	44.1	0.27
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography	1	1	2	3.4	0.50
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology	-	1	1	1.7	1
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	1	2	3	5.1	0.75
	TOTAL	40	19	59	100	0.32

JAMAICA : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	-	-	-	-	-
	12. Mathematics	4	1	5	8.4	0.2
	SUB-TOTAL	4	1	5	8.4	0.2
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry	4	3	7	11.9	0.43
	24. Life Sciences	3	5	8	13.6	0.63
	25. Earth and Space Sciences	8	3	11	18.6	0.27
	SUB-TOTAL	15	11	26	44.1	0.42
Applied Sciences	31. Agricultural and Veterinary Sciences	6	-	6	10.2	-
	32. Medical Sciences	2	5	7	11.9	0.71
	33. Technological Sciences	11	1	12	20.3	0.08
	SUB-TOTAL	19	6	25	42.4	0.24
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences	1	1	2	3.4	0.50
	54. Geography	1	-	1	1.7	-
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	2	1	3	5.1	0.33
	TOTAL	40	19	59	100	0.32

JAMAICA : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	14	13	10	17	5
STS activities	22	10	11	12	4
STET activities	22	14	6	15	2
Purely administrative tasks	14	23	10	9	3
Other activities	39	11	3	6	-

JAMAICA : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	7	3	11	5	6	5	1	1	-	1	40	25	66	15	71
Women	5	2	4	1	1	2	3	1	-	-	19	13	34	6	29
Total	12	5	15	6	7	7	4	2	-	1	59	38	100	21	100
% Women	42	40	27	17	14	28	75	50	-	-	32	34		29	

JAMAICA : TABLE 10

Sector of Performance	National or Foreigners Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions	7	-	7	1	15	7	8
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them. 3. Institutions attached to academies of sciences and/or national research centres. 4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	18	13	8	5	44	31	13
SUB-TOTAL B		18	13	8	5	44	31	13
C. Production	5. R&D laboratories integrated with production							
D. Unspecified	6. Unspecified types							
TOTAL A+B+C+D		25	13	15	6	59	38	21

JAMAICA : TABLE 11

Sector of Performance / Type of institution	Age group: up to 29 years old — Total	30 to 39 — Total	40 to 49 — Total	50 to 59 — Total	60 and over — Total	TOTAL
	(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education						
1. Universities and similar higher educational institutions	3	5	6	1	-	15
B. General Service						
2. Research centres closely linked to the Universities and frequently administered by them.						
3. Institutions attached to academies of sciences and/or national research centres.						
4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	14	16	7	2	5	44
SUB-TOTAL B	14	16	7	2	5	44
C. Production						
5. R&D laboratories integrated with production						
D. Unspecified						
6. Unspecified types						
TOTAL A+B+C+D	17	21	13	3	5	59

ST. LUCIA

83. The socio-economic indicators* for St. Lucia are as follows:

Surface	616 km^2
Population	140.000 inhabitants
GNP per inhabitant (1986)	1320 US $

National S&T capabilities

84. The Central Planning Unit, under the Ministry of Finance and Planning, is the primary centre for the formulation, articulation and implementation of government policy and programmes in Energy, Science and Technology.

Rate of answers to the questionnaires

85. Twelve institutions answered Questionnaire No. 1; among them, 5 were national research centres, 4 were institutions not integrated in production, 3 were of an unspecified type. As for their status, 3 were governmental, 5 semi-governmental and 4 were private. Eleven R&D projects and 1 STS activity were recorded. 24 scientists/engineers replied to Questionnaires No. 3 (49% of the total recorded at the institution level).

Number of personnel in R&D and STS systems
(scientists/engineers, technicians and auxiliary personnel)

86. Table 1 shows that the general service sector regroups most of the personnel (85% of scientists/engineers 99% of technicians, 90% of auxiliary personnel). No personnel was recorded in the higher education sector (St. Lucia depends on the University of West Indies) and in the production sector.

87. The ratio A is equal to 1. It means that part-time scientists/engineers are not employed. For the whole country, the ratio B is approximately equal to 3 (3 technicians per scientist/engineer), but it is lower in natural research centres and in the institutions of unspecified type.

88. The number of auxiliary personnel per scientist/engineer and technician (ratio C) is higher in research centres than in the other types of institutions.

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* Origin: World Bank report 1988

89 Table 2 shows that 92% of technicians and 53% of scientists/engineers belong to the governmental sector while 68% of the auxiliary personnel belong to the semi-governmental sector in which the ratio C is equal to 2.6.

90. The private sector employs 16% of scientists/engineers, 2% of technicians and 10% of auxiliary personnel.

91. For the 3 sectors, the ratio A (number of technicians per scientist/engineer) is equal to 1. The ratio B indicates that there are 4 technicians per scientist/engineer in the governmental sector while that ratio is less than 1 in the 2 other sectors. Note that the ratio C is higher in the semi-governmental sector.

Number of S&T units and average number of scientific workers and technicians

92. Table 3 shows that 21 units were recorded in the 12 institutions surveyed. For the whole country, the average (ratio D, ratio E) is 2 scientists/engineers and 6 to 7 technicians per unit. The number of technician per unit is higher in institutions non-integrated with production (10) and lower in the other types of institutions. No data were recorded in universities in research centres linked to them and in laboratories integrated in production.

Number of R&D projects and average number of scientists/engineers, technicians per R&D project by type of institution

93. Table 4 provides the distribution of personnel assigned to R&D projects. The ratios G, H and I give respectively the number of scientists/engineers, technicians and auxiliary personnel per R&D project. (the average is approximately 1 scientific researcher, 1 technician and 1 auxiliary personnel per R&D project).

94. The ratio F gives the number of technicians per scientific researcher. That ratio is approximately equal to 1 in the general service sector, and is equal to 0.4 in national research centres.

Distribution of scientists and engineers by type of activities on which the are engaged

95. Table 5 shows that all 24 scientists/engineers who replied to Questionnaire No. 3, were engaged in STS activities. Among the 10 scientists/engineers engaged in R&D, 8 are also dealing with training (the ratio J is equal to 0.8). The ratio K is equal to 1 which means that scientists/engineers engaged in R&D are also engaged in STS. The ratio L is less than 1 because all the scientist/engineers engaged in STS are not engaged in training also.

Total number of scientific workers by major discipline of their initial training and current employment

96. Table 6 shows that 25% of scientists/engineers are employed in natural sciences, 50% in applied sciences and 25% in social and human sciences. Women represent 17% of scientists/engineers employed in applied sciences and in social and human sciences.

97. Table 7 shows that 33% of scientists/engineers were trained in natural sciences, 42% in applied sciences and 25% in social and human sciences. Among scientists/engineers trained in applied sciences, 20% are women who also represent 30% of scientists/engineers trained in social and human sciences. The ratio $\frac{\text{Total training}}{\text{Total employment}}$ is more than 1 for natural sciences and less than 1 for applied sciences and social and human sciences.

Distribution of scientific researchers by percentage of time spent in R&D, STS, purely administrative tasks and other activities

98. Table 8 gives the number of scientists/engineers distributed according to the percentage of time spent on different activities. Of the 24 scientists/engineers who replied to Questionnaire No. 3, 8 did not carry out R&D activities, and 7 were not engaged in training. Only 3 researchers spent more than 50% of their time on R&D and 7 spent more than 50% of their time on STS. Note that all the scientists/engineers spent their time in STS activities and in administrative tasks.

Distribution of scientists/engineers by type of institution, sex and nationality

99. Table 9 shows that 58% of scientists who replied to Questionnaire No. 3 are nationals. Women represent only 12.5% of the total. Among men, 43% are foreigners. Scientists/engineers who are over 50 are all foreigners.

Distribution of scientists/engineers by age-groups sex and nationality

100. Table 10 shows that of the 24 scientists/engineers who replied to Questionnnaire No. 3, 16 belonged to the general service sector. Among the 10 foreigners, 5 belonged to the general service sector in which 3 women (2 national and 1 foreigner) were recorded.

Scientist/engineers by type of institution and age group

101. Table 11 shows that most of the scientists/engineers who replied to Questionnaire No. 3 are 30 to 39 years old (62%). The general service sector regroups the important part of scientists/engineers (67%).

ST. LUCIA : TABLE 1

Sector of Performance	Staff engaged on S&T activities Type of institution	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
		Full Time	FTE	Full Time	FTE	Total	2/1	3/1	4/2	5/(1+3)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.									
	3. Institutions attached to academies of sciences and/or national research centres.	7	10	5	6	17	1.4	0.7	0.6	1.4
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	34	34	133	133	54	1	3.9	3.9	0.3
SUB-TOTAL B		41	44	138	139	71	1.1	3.4	3.2	0.4
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types	8	8	2	2	8	1	0.25	0.25	0.8
TOTAL A+B+C+D		49	52	140	141	79	1.1	2.9	2.7	0.4

ST. LUCIA : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	26	29	129	129	17	1.1	4.9	4.4	0.1
2. SEMI-GOVERNMENTAL	13	13	8	8	54	1	0.6	0.6	2.6
3. PRIVATE	8	10	3	4	8	1.25	0.38	0.4	0.7
TOTAL	49	52	140	141	79	1.1	2.9	2.7	0.4

ST. LUCIA : TABLE 3

Sector of Performance	Type of institution	Total Number		Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
		Scientific workers (SE)		Technicians					1/5	2/5	3/5	4/5
		Full Time	FTE	Full Time	FTE							
A. Higher Education	1. Universities and similar higher educational institutions	(1)	(2)	(3)	(4)			(5)	(6)	(7)	(8)	(9)
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.											
	3. Institutions attached to academies of sciences and/or national research centres.	7	10	5	6			5	1.4	2	1	1.2
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	34	34	133	133			13	2.6	2.6	10	10
SUB-TOTAL B		41	44	138	139			18	2.3	2.4	7.7	7.7
C. Production	5. R&D laboratories integrated with production											
D. Unspecified	6. Unspecified types	8	8	2	2			3	2.7	2.7	0.7	0.7
TOTAL A+B+C+D		49	52	140	141			21	2.3	2.5	6.7	6.7

ST. LUCIA : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel					
			FTE	FTE	FTE		2/1	1/4	2/4	3/4
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.									
	3. Institutions attached to academies of sciences and/or national research centres.	5	2	5	2	0.4	2.5	1	2.5	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	4	10	10	6	2.5	0.67	1.67	1.67	
SUB-TOTAL B		9	12	15	8	1.3	1.1	1.5	1.9	
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types	6	4	4	3	0.67	2	1.3	1.3	
TOTAL A+B+C+D		19	16	19	11	0.8	1.7	1.5	1.7	

ST. LUCIA : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
			R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	3	-	-	1	-	-	0.3	
	3. Institutions attached to academies of sciences and/or national research centres.									
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	10	13	10	8	10	0.8	1	0.8	
SUB-TOTAL B		10	16	10	8	11	0.8	1	0.5	
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types	6	8	6	4	6	0.7	1	0.75	
TOTAL A+B+C+D		16	24	16	12	17	0.75	1	0.7	

ST. LUCIA : TABLE 6

(EMPLOYMENT)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry					
	24. Life Sciences	5	-	5	21	-
	25. Earth and Space Sciences	1	-	1	4	-
	SUB-TOTAL	6	-	6	25	-
Applied Sciences	31. Agricultural and Veterinary Sciences	7	1	8	33	0.12
	32. Medical Sciences	2	-	2	8	-
	33. Technological Sciences	1	1	2	8	0.12
	SUB-TOTAL	10	2	12	50	0.17
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences	1	-	1	4	-
	54. Geography	1	-	1	4	-
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science	1	-	1	4	-
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology	2	1	3	13	0.33
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	5	1	6	25	0.17
	TOTAL	21	3	24	100	0.12

ST. LUCIA : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry	2	-	2	8.3	-
	24. Life Sciences	6	-	6	25	-
	25. Earth and Space Sciences					
	SUB-TOTAL	8	-	8	33.3	-
Applied Sciences	31. Agricultural and Veterinary Sciences	6	1	7	29.2	0.14
	32. Medical Sciences					
	33. Technological Sciences	2	1	3	12.5	0.33
	SUB-TOTAL	8	2	10	41.7	0.2
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences	1	1	2	8.3	0.5
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy	2	1	3	12.5	0.3
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology	1	-	1	4.2	-
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	4	2	6	25	0.3
	TOTAL	20	4	24	100	0.17

ST. LUCIA : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	8	7	6	2	1
STS activities	-	10	7	3	4
STET activities	7	15	2	-	-
Purely administrative tasks	-	15	5	3	1
Other activities	9	13	2	-	-

ST. LUCIA : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	3	-	9	4	-	-	-	4	-	1	21	12	85.7	9	90
Women	1	-	1	-	-	-	-	1	-	-	3	2	14.3	1	10
Total	4	-	10	4	-	-	-	5	-	1	24	14	100	10	100
% Women	25	-	10	-	-	-	-	20	-	-	12.5	14.3		11	

ST. LUCIA : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions							
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	2	-	-	1	3	2	1
	3. Institutions attached to academies of sciences and/or national research centres.							
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	7	2	4	-	13	9	3
SUB-TOTAL B		9	2	4	1	16	11	5
C. Production	5. R&D laboratories integrated with production							
D. Unspecified	6. Unspecified types	3	-	5	-	8	3	5
TOTAL A+B+C+D		12	2	9	1	24	14	10

ST. LUCIA : TABLE 11

Sector of Performance	Type of institution	Age group: up to 29 years old — Total	30 to 39 — Total	40 to 49 — Total	50 to 59 — Total	60 and over — Total	TOTAL
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions						
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.						
	3. Institutions attached to academies of sciences and/or national research centres.	-	2	-	1	-	3
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	4	7	-	2	-	13
SUB-TOTAL B		4	9	-	3	-	16
C. Production	5. R&D laboratories integrated with production						
D. Unspecified	6. Unspecified types	-	5	-	2	1	8
TOTAL A+B+C+D		4	14	-	5	1	24

ST VINCENT AND THE GRENADINES

102. The socio-economic indicators* for St. Vincent and the Grenadines are as follows:

Surface:	388 Km^2
Population	119.000 inhabitants
GNP per inhabitant	960 US $

National S&T capabilities

103. No data was available.

Rate of answers to the questionnaires

104. Twelve institutions answered Questionnaire No. 1; all of them belonged to the general service sector. As for their status, 2 were governmental, 6 semi-governmental and 4 were private, 3 R&D projects and 10 STS activities were concerned with Questionnaire No. 2 while 26 scientists/engineers replied to Questionnaire No. 3.

Number of personnel in the R&D and STS system (scientists/engineers, technicians, auxiliary personnel)

105. Table 1 shows that 96 % of the scientists/engineers, 97.8 % of technicians and 98 % of auxiliary personnel belong to institutions not integrated in production. The ratio A is equal to 1 (part time scientists/engineers are not employed); the ratio B gives the number of technicians per scientist/engineer; its value is 2 or 3).

106. Table 2 gives the distribution of the personnel according to the economic sector 42.1 % of scientists/engineers, 67.9 % of technicians and 50.3 % of auxiliary personnel belong to the governmental sector where ratio B is equal to 5 (5 technicians per scientist/engineer). The semi-governmental sector regroups 45.6 % of scientists/engineers, 25.1 % of technicians, and 21.5 % of auxiliary personnel. The private sector regroups 12.3 % of scientists/engineers, 7 % of technicians and 28.2 % of auxiliary personnel. In the private and the semi-governmental sectors, there are 2 technicians per scientist/engineer (ratio B = 2). The private sector employs more auxiliary personnel than other sectors (ratio C = 12).

Number of S&T units and average number of scientific workers and technicians

107. Table 3 gives the distribution of personnel and of units per sector of performance. Among the 12 institutions surveyed, 13 S&T units were recorded. Ratio D gives the number of scientist/engineers per unit (0.5 in research centres linked to University, 4.5 in institutions not integrated in production). Ratio D gives the number of technicians per unit (4 in research centres, linked to universities and 15.2 in institutions not integrated in production).

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* Origin: World Bank report, 1988.

Number of R&D projects and average number of personnel per R&D project by type of institution

108. Table 4 provides the distribution of personnel assigned to R&D projects. The ratio F (respectively 2 and 5) gives the number of technicians per scientist/engineer, the ratios G, H and I give respectively the number of scientist/engineer, the number of technicians and the number of auxiliary personnel per R&D project; their averages are respectively 4.7, 3.7 and 22.

Distribution of scientists/engineers by type of activities in which they are engaged

109. Table 5 shows that the scientists/engineers who replied to Questionnaire No. 3 are all engaged in STS activities and 5 of them are also dealing with STET.

Total number of scientists/engineers by major discipline of their initial training and current employment

110. Table 6 shows that the scientists/engineers who replied to Questionnaire No. 3 are all employed in applied sciences (medical sciences 8.7 %, technological sciences 91.3 %); women represent 21.7 % of the scientists.

111. Table 7 shows that the scientists/engineers who replied to Questionnaire No. 3 are all trained in applied sciences.

Distribution of scientists/engineers by percentage of time spent in R&D, STS, STET, administrative tasks and other activities

112. Table 8 gives the number of the scientists/engineers who replied to Questionnaire No. 3 according to the time spent in different activities. None of the 26 scientists/engineers recorded was involved in R&D; 20 of them (77 %) spent more than 50 % of their time on STS.

Distribution of scientists/engineers by age group, nationality, sex and type of institution

113. Table 9 shows that all the scientists/engineers who replied to Questionnaire No. 3 are under 30 years of age.

114. Tables 10 and 11 show that 84.6 % of scientists/engineers belong to institutions not integrated in production.

ST. VINCENT & GRENADINE : TABLE I

Sector of Performance / Type of institution	Staff engaged on S&T activities	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
		Full Time	FTE	Full Time	FTE	Total	2/1	3/1	4/2	5/(1+3)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	2	2	4	4	18	1	2	2	3
	3. Institutions attached to academies of sciences and/or national research centres.									
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	54	55	182	183	863	1	3.3	3.3	3.7
SUB-TOTAL B		56	57	186	187	879	1	3.3	3.3	3.6
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D		56	57	186	187	881	1	3.3	3.3	3.6

ST. VINCENT & GRENADINE : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	24	24	127	127	443	1	5.3	5.3	2.6
2. SEMI-GOVERNMENTAL	25	26	46	47	189	1	1.8	1.8	2.6
3. PRIVATE	7	7	13	13	249	1	1.9	1.9	12
TOTAL	56	57	186	187	881	1	1	3.3	3.6

ST. VINCENT & GRENADINE : TABLE 3

Sector of Performance	Type of institution	Total Number	Total number of personnel				Number of S&T Units	Ratio D		Ratio E	
			Scientific workers (SE)		Technicians			1/5	2/5	3/5	4/5
			Full Time	FTE	Full Time	FTE					
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions										
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.		2	2	4	4	1	0.5	0.5	4	4
	3. Institutions attached to academies of sciences and/or national research centres.										
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.		54	55	182	183	12	4.5	4.6	15.2	15.3
SUB-TOTAL B			56	57	186	187	13	4.3	4.4	14.3	14.4
C. Production	5. R&D laboratories integrated with production										
D. Unspecified	6. Unspecified types										
TOTAL A+B+C+D			56	57	186	187	13	4.3	4.4	14.3	14.4

ST. VINCENT & GRENADINE : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel		2/1	1/4	2/4	3/4
			FTE	FTE	FTE					
		(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions									
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	1	2	2		1	2	1	2	2
	3. Institutions attached to academies of sciences and/or national research centres.									
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	13	9	65		2	5	6.5	4.5	32.5
SUB-TOTAL B		14	11	67		3	4.8	4.7	3.7	22
C. Production	5. R&D laboratories integrated with production									
D. Unspecified	6. Unspecified types									
TOTAL A+B+C+D		14	11	67		3	4.8	4.7	3.7	22

ST. VINCENT & GRENADINE : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers				Ratios		
		R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions								
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	-	2	-	-	-	-	-	-
	3. Institutions attached to academies of sciences and/or national research centres.								
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	-	20	-	-	5	-	-	0.25
SUB-TOTAL B		-	22	-	-	5	-	-	0.25
C. Production	5. R&D laboratories integrated with production	-	2	-	-	-	-	-	-
D. Unspecified	6. Unspecified types								
TOTAL A+B+C+D		-	24	-	-	5	-	-	0.2

ST. VINCENT & GRENADINES TABLE 6

(EMPLOYMENT)

	Number of Personnel Discipline	Men Total	Women Total	Men and Women Total	 %	Ratios Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry					
	24. Life Sciences					
	25. Earth and Space Sciences					
	SUB-TOTAL					
Applied Sciences	31. Agricultural and Veterinary Sciences					
	32. Medical Sciences	2	-	2	8.7	-
	33. Technological Sciences	16	5	21	91.3	0.22
	SUB-TOTAL	18	5	23	100	0.217
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL	-	-	-	-	-
	TOTAL	18	5	23	100	0.217

ST. VINCENT & GRENADINE : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics					
	SUB-TOTAL					
Natural Sciences	21. Astronomy and Astrophysics					
	22. Physics					
	23. Chemistry					
	24. Life Sciences					
	25. Earth and Space Sciences					
	SUB-TOTAL					
Applied Sciences	31. Agricultural and Veterinary Sciences	-	-	-	-	-
	32. Medical Sciences	1	-	1	5.6	-
	33. Technological Sciences	14	3	17	94.4	0.18
	SUB-TOTAL	15	3	18	100	0.18
Social and Human Sciences	51. Anthropology					
	52. Demography					
	53. Economic Sciences					
	54. Geography					
	55. History					
	56. Juridical Sciences and Law					
	57. Linguistics					
	58. Pedagogy					
	59. Political Science					
	61. Psychology					
	62. Sciences of Arts and Letters					
	63. Sociology					
	71. Ethics					
	72. Philosophy					
	SUB-TOTAL					
	TOTAL	15	3	18	100	0.18

ST. VINCENT & GRENADINE : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	26	-	-	-	-
STS activities	2	1	3	4	16
STET activities	21	5	-	-	-
Purely administrative tasks	13	6	5	1	1
Other activities	21	3	1	1	-

ST. VINCENT & GRENADINE : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	10	-	9	-	1	-	-	-	-	-	20	20	76.9	-	-
Women	4	-	2	-	-	-	-	-	-	-	6	6	23.1	-	-
Total	14	-	11	-	1	-	-	-	-	-	26	26	100	-	-
% Women	28.6	-	18.2	-	-	-	-	-	-	-	23.1	23.1		-	

ST. VINCENT & GRENADINE : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions							
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	2	-	-	-	2	2	-
	3. Institutions attached to academies of sciences and/or national research centres.	-	-	-	-	-	-	-
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	17	5	-	-	22	22	-
SUB-TOTAL B		19	5	-	-	24	24	-
C. Production	5. R&D laboratories integrated with production	1	1	-	-	2	-	-
D. Unspecified	6. Unspecified types							
TOTAL A+B+C+D		20	6	-	-	26	-	-

ST. VINCENT & GRENADINE : TABLE 11

Sector of Performance	Age group / Type of institution	up to 29 years old Total	30 to 39 Total	40 to 49 Total	50 to 59 Total	60 and over Total	TOTAL
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions						
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	1	-	1	-	-	2
	3. Institutions attached to academies of sciences and/or national research centres.						
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	12	10	-	-	-	22
SUB-TOTAL B		13	10	1	-	-	24
C. Production	5. R&D laboratories integrated with production	1	1	-	-	-	2
D. Unspecified	6. Unspecified types						
TOTAL A+B+C+D		14	11	1	-	-	26

TRINIDAD & TOBAGO

115. The socio-economic indicators * for Trinidad and Tobago are as follows :

Surface	5 thousand KM2
Population	1.2 million inhabitants
GNP per inhabitant(1986)	5.360 US$

National S&T capabilities

116. A broadly based national Council on Science and Technology was established in October 1975, the functions of which are : (i) to co-ordinate scientific and technological research and development (R&D) and (ii) to advise the government on national policies.

117. The National Institute of Higher Education (NIHERST) was established in 1984. It is an executive body, the principal functions of which are (i) to promote and provide scientific and technological service in the country and (ii) to promote and operate facilities for higher and continuing education.

Rate of answers to the questionnaires

118. Fifty-three institutions replied to Questionnaire No.1. Among them :

24 were governmental,
14 semi-governmental,
15 private.

As for the type of institution :

7 were universities and similar institutions of higher education;

2 research centres closely associated with universities;

3 institutions attached to national research centres/Councils;

15 research institutions not integrated in production;

10 research laboratories;

16 of unspecified type.

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* Origin : World Bank report 1988

119. 126 R&D projects and 14 STS activities (Questionnaire N°2) were recorded.

120. 422 scientists and engineers completed Questionnaire N°3, that means 55% of the total recorded at the level of the 53 institutions (768).

Number of personnel in the R&D and STS system (scientists and engineers (SE), technicians and auxiliary personnel) by sector of performance and by economic sector.

121. Table 1 shows that most of personnel belongs to the general service which regroups 43.6% of scientists and engineers, 47.4% of technicians, 39.7% of auxiliary personnel. The higher education sector regroups 28.4% of scientists and engineers, 16.8% of technicians, 18.8 % of auxiliary personnel. For the production sector, these three percentages are respectively 6.8%, 10.5% and 6.4%. For unspecified types, these percentages are respectively 21.2%, 25.3% and 35.2%.

122. The ratio A (full-time SE + part-time SE expressed in FTE) divided by full time SE), is equal to 1. It means that few part-time SE are employed in the S&T institutions.

123. The ratio B gives the number of technicians per scientist. It measures how much assistance is provided to scientists and engineers, that ratio is better for the production sector (1.77) than for institutions not integrated in production (1.3) and for those attached to national research centres (1.1). It is weak in the universities (0.67) and in the research centres closely linked to the universities (0.41).

124. The ratio C expresses the number of auxiliary personnel in relation to the total number of scientific workers and technicians taken together. It indicates the "ratio of bureaucratization" of an institution. This ratio is high in the institutions attached to national research centres (2.9) and low in the institutions not integrated in production (0.55). In the production sector it is 0.63 and in universities it is 0.71.

125. Table 2 shows the three ratios A, B and C according to the economic sector. For the three sectors, the ratio A is the same (value = 1); the ratio B is better for the private sector (value = 1.67), than for the governmental sector (1.28). The ratio C is better for the private sector (0.42) and higher for the governmental sector (1.15).

Number of S&T units and average number of scientific workers and technicians by unit and sector of performance

126. Table 3 gives the average size of the S&T Unit by sector of performance. Ratios D and E provide a basis for assessing how the various types of institutions and sectors of performance of S&T activities are run. The size of units is bigger in institutions attached to national research centres (11 SE and 12 technicians), than in universities (9 SE and 6 technicians). The average for the whole country is 4 SE and 5 technicians per unit.

Number of R&D projects and average number of scientists/engineers and technicians by R&D project, by type of institution and by sector of performance

127. Table 4 provides the distribution of personnel assigned to R&D projects and their average number by research project (ratios G, H and I). The average for the whole country is 1 scientist, 1 technician, 1 auxiliary personnel per project. It also reveals the technical support supplied to researchers participating in R&D projects and the number of technicians allocated to them (ratio F). The ratio F is better in R&D and STS institutions not integrated with production (2 technicians per researcher). It is lower in universities.

Distribution of scientists and engineers by type of activities on which they are engaged.

R&D : for scientific researchers
STS : for STS personnel
STET : for teacher researchers, by type of institution and by sector of performance on the one hand, and economic sector on the other.

128. Table 5 provides the number of scientists/engineers engaged in three types of activities : R&D, STS and STET.

129. The ratio J $\frac{\text{R\&D + STET}}{\text{R\&D}}$ indicates the relative importance of higher education and the symbiotic relationship between R&D and higher education. This ratio is higher in universities (0.86) and lower in research centres (0.53).

130. The ratio K $\frac{\text{R\&D + STS}}{\text{(R\&D)}}$ is higher in national research centres (0.93) and lower in universities (0.57). The ratio L $\frac{\text{STS + STET}}{\text{(STS)}}$ is higher in universities (1) and lower in research centres closely linked with universities.

Total number of scientific workers by major discipline of their initial training and current employment

131. In Tables 6 and 7 the analyses establish the correspondence between the training and employment of personnel by major S&T field or discipline. The tables (column 4) give the percentage of the total number (men and women) in each discipline and (column 5) the ratio of women by discipline. The ratio : $\frac{\text{Total training}}{\text{Total employment}}$ when > 1, indicates too many people are being trained in relation to employment opportunies available.

a) initial training : 5% of scientists are trained in exact sciences, 12.1% in natural sciences, 59% in applied sciences and

23.9% in social and human sciences. Women represent 38.1% of scientists trained in exact sciences, 27.5% in natural sciences, 25.7% in applied sciences and 46.5 in social and human sciences.

b) employment : 5% of scientists are employed in exact sciences, 11.4% in natural sciences, 61.8% in applied sciences, and 21.9% in social and human sciences. Women represent 42.9% of scientists employed in exact sciences, 20.8% in natural sciences, 26.5% in applied sciences, 48.9% in social sciences.

132. The ratio $\frac{\text{training}}{\text{employment}}$ is <1 for exact sciences and applied sciences. It is > 1 for natural sciences and social and human sciences.

Distribution of scientific researchers by percentage of time spent on R&D, STS activities, purely administrative tasks and other activities

133. Table 8 : This analysis identifies the type of activity which takes up most of the time of scientific researchers. It shows up those cases in which scientific researchers spent more time on purely administrative tasks than on R&D, STS and STET activities.

134. This table shows that 200 scientists and engineers (among 422) spend more than 50% of their time on STS activities, 61 of them spend more than 50% of their time on R&D and 75 more than 50% of their time on administrative tasks. 240 do not carry out R&D activities.

Distribution of scientific researchers by age-group, nationality and sex.

135. Table 9 is used to construct an age-pyramid for scientists and engineers and provides a significant indicator for estimating future personnel in the field of science and technology. Young women (43.2%) (less than 30 years old) have access to scientific and technological careers. The proportion of foreigners in the total number of SE (9.2%) provides information about international mobility. Note that no woman over 60 has been recorded.

Scientific researchers by type of institution, sector of performance, sex and nationality

136. Table 10 shows that 32% of national scientists/engineers are women; 26% are foreigners. The percentage (56%) of foreigners is relatively high in universities and similar educational institutions. In other types of institutions, the percentage of national scientists/engineers is more than 80%

Scientific researchers by type of institution, sector of performance and age group

137. Table 11 provides information to construct an age-pyramid for scientists/engineers. According to this table, 87% of SE are under 50, that means the T'T scientists are relatively young. It can be noted that 51% of SE are under 40.

TRINIDAD & TOBAGO : TABLE I

Sector of Performance / Type of institution	Staff engaged on S&T activities	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
							2/1	3/1	4/2	5/(1+3)
		Full Time	FTE	Full Time	FTE	Total				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	218	218	147	147	260	1	0.67	0.67	0.71
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	29	29	12	12	45	1	0.41	0.41	1.55
	3. Institutions attached to academies of sciences and/or national research centres.	76	76	84	84	221	1	1.11	1.11	2.90
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	224	230	299	319	289	1.03	1.33	1.39	0.55
SUB-TOTAL B		329	335	395	415	555	1.02	1.20	1.24	0.77
C. Production	5. R&D laboratories integrated with production	52	52	92	92	90	1	1.77	1.77	0.63
D. Unspecified	6. Unspecified types	162	163	222	222	492	1	1.37	1.36	1.28
TOTAL A+B+C+D		761	768	856	876	1397	1.01	1.12	1.14	0.86

TRINIDAD & TOBAGO : TABLE 2

Number of personnel / Economic sector	Scientists and Engineers (SE)		Technicians		Auxiliary personnel	Ratio A	Ratio B		Ratio C
						2/1	3/1	4/2	5/(1+3)
	Full Time	FTE	Full Time	FTE	Total				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. GOVERNMENTAL	316	323	394	414	814	1.02	1.25	1.28	1.15
2. SEMI-GOVERNMENTAL	329	329	268	268	454	1	0.81	0.81	0.76
3. PRIVATE	116	116	194	194	129	1	1.67	1.67	0.42
TOTAL	761	768	856	876	1397	1.01	1.12	1.14	0.92

TRINIDAD & TOBAGO : TABLE 3

Sector of Performance	Type of institution	Total Number					Ratio D		Ratio E	
		Total number of personnel								
		Scientific workers (SE)		Technicians		Number of S&T Units	1/5	2/5	3/5	4/5
		Full Time	FTE	Full Time	FTE					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Higher Education	1. Universities and similar higher educational institutions	218	218	147	147	25	8.7	8.7	5.9	5.9
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	29	29	12	12	6	4.83	4.83	2	2
	3. Institutions attached to academies of sciences and/or national research centres.	76	76	84	84	7	10.8	10.8	12	12
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	224	230	299	319	64	3.5	3.6	4.7	4.98
SUB-TOTAL B		329	335	395	415	77	4.3	4.4	5.1	5.4
C. Production	5. R&D laboratories integrated with production	52	52	92	92	16	3.3	3.3	5.8	5.8
D. Unspecified	6. Unspecified types	162	162	222	222	54	3	3	4.1	4.1
TOTAL A+B+C+D		761	768	856	876	172	4.4	4.5	4.98	5.1

TRINIDAD & TOBAGO : TABLE 4

Sector of Performance	Type of institution	Total Number	Personnel assigned to R&D projects			Number of R&D projects	Ratio F	Ratio G	Ratio H	Ratio I
			Scientific Researchers	Technicians	Auxiliary Personnel					
			FTE	FTE	FTE		2/1	1/4	2/4	3/4
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Higher Education	1. Universities and similar higher educational institutions	21	2	4	6	0.09	3.5	0.3	0.7	
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	20	5	11	6	0.25	3.3	0.8	1.8	
	3. Institutions attached to academies of sciences and/or national research centres.	56	26	2	32	0.5	1.8	0.8	0.06	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	38	91	93	33	2.4	1.2	2.8	2.8	
SUB-TOTAL B		114	122	106	71	1.1	1.6	1.7	1.5	
C. Production	5. R&D laboratories integrated with production	30	13	36	32	0.43	0.9	0.4	1.1	
D. Unspecified	6. Unspecified types	14	7	18	7	0.5	2	1	2.6	
TOTAL A+B+C+D		179	144	164	116	0.8	1.5	1.2	1.4	

TRINIDAD & TOBAGO : TABLE 5

Sector of Performance	Type of institution	Total Number	Scientists and Engineers					Ratios		
			R&D	STS	R&D and STS	R&D and STET	STS and STET	Ratio J	Ratio K	Ratio L
		Total	Total	Total	Total	Total	Total	4/1	3/1	5/2
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
A. Higher Education	1. Universities and similar higher educational institutions	14	10	8	12	10	0.9	0.57	1	
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	19	18	15	10	8	0.53	0.8	0.4	
	3. Institutions attached to academies of sciences and/or national research centres.	40	48	37	27	30	0.7	0.9	0.6	
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	50	112	36	33	59	0.7	0.7	0.5	
SUB-TOTAL B		109	178	88	70	97	0.6	0.8	0.5	
C. Production	5. R&D laboratories integrated with production	31	31	23	21	21	0.7	0.7	0.7	
D. Unspecified	6. Unspecified types	26	117	27	7	33	0.2	0.9	0.3	
TOTAL A+B+C+D		183	336	146	110	161	0.6	0.8	0.5	

TRINIDAD & TOBAGO : TABLE 6

(EMPLOYMENT)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic					
	12. Mathematics	12	9	21	5	0.43
	SUB-TOTAL	12	9	21	5	0.43
Natural Sciences	21. Astronomy and Astrophysics	–	–	–	–	–
	22. Physics	–	–	–	–	–
	23. Chemistry	1	–	1	0.2	–
	24. Life Sciences	–	1	1	0.2	–
	25. Earth and Space Sciences	37	9	46	10.9	0.20
	SUB-TOTAL	38	10	48	11.4	0.20
Applied Sciences	31. Agricultural and Veterinary Sciences	18	3	21	5	0.14
	32. Medical Sciences	24	6	30	7.1	0.20
	33. Technological Sciences	149	60	209	49.6	0.29
	SUB-TOTAL	191	69	260	61.8	0.27
Social and Human Sciences	51. Anthropology	–	–	–	–	–
	52. Demography	1	1	2	0.5	0.50
	53. Economic Sciences	32	26	58	13.8	0.45
	54. Geography	3	1	4	0.95	0.25
	55. History	2	–	2	0.5	–
	56. Juridical Sciences and Law	2	–	2	0,5	–
	57. Linguistics	2	1	3	0.7	0.33
	58. Pedagogy	2	–	2	0.5	–
	59. Political Science	1	2	3	0.6	0,67
	61. Psychology	–	–	–	–	–
	62. Sciences of Arts and Letters	1	3	4	0,95	0,75
	63. Sociology	–	11	11	2,6	1
	71. Ethics	1	–	1	0,2	–
	72. Philosophy	–	–	–	–	–
	SUB-TOTAL	47	45	92	21.8	0,49
	TOTAL	288	133	421	100	0.32

TRINIDAD & TOBAGO : TABLE 7

(TRAINING)

	Number of Personnel	Men	Women	Men and Women		Ratios
	Discipline	Total	Total	Total	%	Ratio M 2/3
		1	2	3	4	5
Exact Sciences	11. Logic	–				
	12. Mathematics	13	8	21	5	0.38
	SUB-TOTAL	13	8	21	5	0.38
Natural Sciences	21. Astronomy and Astrophysics	–				
	22. Physics	–				
	23. Chemistry	–				
	24. Life Sciences	1	2	3	0.7	0.67
	25. Earth and Space Sciences	36	12	48	11.4	0.25
	SUB-TOTAL	37	14	51	12.1	0.28
Applied Sciences	31. Agricultural and Veterinary Sciences	15	2	17	4.03	0.12
	32. Medical Sciences	28	9	37	8.8	0.24
	33. Technological Sciences	142	53	195	46.2	0.27
	SUB-TOTAL	185	64	249	59	0.26
Social and Human Sciences	51. Anthropology	–	–	–	–	–
	52. Demography	1	–	1	0.2	–
	53. Economic Sciences	35	28	63	14.9	0.44
	54. Geography	4	–	4	0.94	–
	55. History	1	1	2	0.47	0.50
	56. Juridical Sciences and Law	2	1	3	0.70	0.33
	57. Linguistics	1	–	1	0.2	–
	58. Pedagogy	4	1	5	1.19	0.20
	59. Political Science	1	–	1	0.2	–
	61. Psychology	1	1	2	0.47	0.50
	62. Sciences of Arts and Letters	1	2	3	0.7	0.70
	63. Sociology	2	12	14	3.32	0.86
	71. Ethics	–	1	1	0.2	0.50
	72. Philosophy	1	–	1	0.2	–
	SUB-TOTAL	54	47	101	23.9	0.47
	TOTAL	289	133	422	100	0.32

TRINIDAD & TOBAGO : TABLE 8

Percentage of time of Scientific Researchers / Type of activity	0 %	Less than 25 %	25 % to 50 %	50 % to 75 %	75 % to 100 %
R&D activities	240	68	53	35	26
STS activities	85	76	61	76	124
STET activities	223	164	19	9	7
Purely administrative tasks	121	153	73	37	38
Other activities	10	151	220	18	23

TRINIDAD & TOBAGO : TABLE 9

Age group / Sex	up to 29 years old		30 to 39		40 to 49		50 to 59		60 and over		Overall Total	Of which			
	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.	Nat.	For.		Nat.		For.	
												No.	%	No.	%
Men	49	1	102	7	73	13	31	7	5	1	289	260	67.9	29	74.4
Women	37	1	57	3	19	5	10	1	0	0	133	123	32.1	10	25.6
Total	86	2	159	10	92	18	41	8	5	1	422	383	100	39	100
% Women	43%	50%	36%	30%	21%	28%	23%	12,5%	0%	0%	31.5%	32%	-	26%	-

TRINIDAD & TOBAGO : TABLE 10

Sector of Performance	National or Foreigners / Type of institution	Nationals		Foreigners		Overall	Of which	
		Men	Women	Men	Women	Total	National	Foreigners
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Higher Education	1. Universities and similar higher educational institutions	4	4	7	3	18	8	10
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	13	6	2	1	22	19	3
	3. Institutions attached to academies of sciences and/or national research centres.	33	17	4	2	56	50	6
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	94	40	2	1	137	134	3
SUB-TOTAL B		140	63	8	4	215	203	12
C. Production	5. R&D laboratories integrated with production	26	8	6	2	42	34	8
D. Unspecified	6. Unspecified types	90	48	8	1	147	138	9
TOTAL A+B+C+D		260	123	29	10	422	383	39

TRINIDAD & TOBAGO : TABLE 11

Sector of Performance / Type of institution	Age group	up to 29 years old	30 to 39	40 to 49	50 to 59	60 and over	TOTAL
		Total	Total	Total	Total	Total	
		(1)	(2)	(3)	(4)	(5)	(6)
A. Higher Education	1. Universities and similar higher educational institutions	–	5	10	3	–	18
B. General Service	2. Research centres closely linked to the Universities and frequently administered by them.	4	10	5	3	–	22
	3. Institutions attached to academies of sciences and/or national research centres.	15	19	16	6	–	56
	4. R&D and STS institutions not integrated with production and partly or wholly serving a productive sector of the economy, a branch of industry or a public service.	26	55	40	16	–	137
SUB-TOTAL B		45	84	61	25	–	215
C. Production	5. R&D laboratories integrated with production	14	16	10	2	–	42
D. Unspecified	6. Unspecified types	29	64	29	19	6	147
TOTAL A+B+C+D		88	169	110	49	6	422

IV. CONCLUSIONS AND RECOMMENDATIONS

138. Taking into account data sent to Unesco by the national coordinators, the first Caribbean STP survey was not quite exhaustive.

139. Three countries out of ten did not complete their first STP survey.

140. This first survey gives a snapshot of the resources in science and technology for the seven Caribbean countries during 1986.

141. In each country, the STP survey and the department responsible for carrying it out should be established on a permanent basis (**Recommendation No.1**)

142. The STP survey should be carried out at two levels of detail at different intervals:

a) first level of detail, on an annual basis, which concerns the basic information on human and financial resources collected by means of a succinct questionnaire;

b) second level of detail, covered on a biennial or triennal basis which should give the complete statistical and descriptive data which constitute a firm basis for the preparation and management of the national science and technology policy (**Recommendation No. 2**).

ANNEX A

LIST OF CO-ORDINATORS

Country	
Antigua/Barbuda	Dr Hayden Thomas Ministry of Agriculture
Barbados	Dr R. Gonzales NCST
Dominica*	Mrs Cornelia Williams Department of Library services
Grenada	Dr James de Vere Pitt NCST
Guyana*	Dr V. O'D Trotz NSRC
Jamaica	Dr H.I.C. Lowe Ministry of Agriculture
Saint Lucia	Mr Aubert d'Auvergne Central Planning Unit
St. Vincent & the Grenadines	Mrs Pearl Herbert Ministry of Education
Suriname*	Mr J.C. Marte Anton Kom University
Trinidad & Tobago	Mr Carl Atherley Central Statistical Office

* Country which did not send data to Unesco

ANNEX B

UNDP/RLA/85/013

SURVEY OF CARIBBEAN SCIENTIFIC AND TECHNOLOGICAL POTENTIAL (STP)

QUESTIONNAIRE NO. 1

SCIENTIFIC AND/OR TECHNOLOGICAL INSTITUTION (S&T)*

Research and Experimental Development (R&D)*
Scientific and Technological Services (STS)*

N.B.
1. This questionnaire should be completed by the Head of the *Institution.*
2. Terms marked with an asterisk (*) in the text are defined in the 'Definitions and Instructions' accompanying this questionnaire.
3. Do not write anything in the boxes entitled 'zone for coding the answers on completion of the questionnaire'. These are to be filled in by the analysts/ interviewers.

Part to be completed by the organization carrying out the STP survey.

Name of organization: .....

Name of interviewer: .....

Date received: .....

Date coded: .....

Date checked: .....

Date transcribed: .....

ZONE FOR CODING THE ANSWERS ON COMPLETION OF THE QUESTIONNAIRE

Country: 1 3

Reference year:* 19..... 4 5

I. **General characteristics of the Institution*** 6 8

1. Name of the Institution 1 0 1 (9 11)

..... 12 31

..... 32 51

Acronym of Institution .....

..... 52 59

2. Name and first name of the Head of the Institution

..... 60 80

3. Full address of the Institution 1 0 2 (2/9 11)

(a) Town or City 12 26

(b) Street (square, avenue, etc.) .....

..... No. 27 50

(c) Postal code 51 56

(d) P.O. Box 57 64

(e) Telephone 65 72

(f) Telex 73 80

1 0 3 (3/3 11)

4. Year of foundation of the Institution: 19..... 12 13

5. Legal/administrative status* of the Institution. (Draw a circle around the code of the appropriate answer)

1 = governmental

2 = semi-governmental 14

3 = private

6. Type of Institution. (Draw a circle around the code of the appropriate answer)

1 = Universities and similar institutions of higher education

2 = Research centres closely associated with universities (and often under their management) 15

3 = Institutions attached to academies of science and/or national research centres/councils

ZONE FOR CODING ANSWERS

4 = Research institutions not integrated with production, wholly or partly serving a productive sector of the economy, a branch of industry or a public service

5 = Research laboratory integrated with production

6 = Others (specify).....

.....

7. Type of Scientific and Technological Activities* (STA) carried out by the Institution (Put an 'X' in the appropriate boxes below)

☐ S&T Research* and/or experimental Development* (R&D) ⌊⌋ 16

☐ Scientific and Technological Services* (STS) ⌊⌋ 17

☐ S&T Education and Training* (STET) ⌊⌋ 18

8. If the Institution is engaged in R&D activities* indicate approximatively what percentage of its work is devoted to each type of research. If not, go to question 9 below

	percentage	
(a) Fundamental Research*	.....	⌊⌋⌊⌋ 19 21
(b) Applied Research*	.....	⌊⌋⌊⌋ 22 24
(c) Experimental Development*	.....	⌊⌋⌊⌋ 25 27
Total	100%	

9. If the Institution is engaged in STS activities* please put an 'X' in the appropriate boxes below. If not, go to question 10 below.

☐ Scientific and technological information and documentation (STID)* ⌊⌋ 28

☐ Museums and collection of science and/or technology* ⌊⌋ 29

☐ General purpose data collection* ⌊⌋ 30

☐ Testing, standardization, metrology and quality control* ⌊⌋ 31

☐ Counselling and extension work* ⌊⌋ 32

☐ Activities relating to patents and licences* ⌊⌋ 33

☐ Translation and/or editing S&T books and periodicals* ⌊⌋ 34

☐ Others (specify).....

..... ⌊⌋ 35

ZONE FOR CODING ANSWERS

10. Names of the S&T Units* which belong to the Institution. (Use separate sheet if necessary.) If not applicable go to Question II, 1, below.

(a) .....

..... 36 37

(b) .....

..... 38 39

(c) .....

..... 40 41

(d) .....

..... 42 43

(e) .....

..... 44 45

(f) .....

..... 46 47

(g) .....

..... 48 49

(h) .....

..... 50 51

(i) .....

..... 52 53

(j) .....

..... 54 55

(k) .....

..... 56 57

(l) .....

..... 58 59

(m) .....

..... 60 61

II. Human resources of the Institution

1. **Full-time* personnel**	Present on last day of reference year	Present 3 years ago	Left during the last 3 years	Arrived during the last 3 years
(a) Scientists and engineers*	.....	.....	.....	.....
(b) Technicians*	.....	.....	.....	.....
(c) Auxiliary personnel*	.....	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX	XXXXXXXXXXXXXXX

2. **Part-time* personnel expressed in full-time equivalent* present on last day of reference year** (fractions may be used when applicable)

(a) Scientists and engineers .....

(b) Technicians .....

ZONE FOR CODING ANSWERS

1 0 4
4/9 11

1. (a) 12 14 | 15 17 | 18 20 | 21 23

(b) 24 26 | 27 29 | 30 32 | 33 35

(c) 36 38

2. (a) 39 41

(b) 42 44

III. Financial resources of the Institution

A. **Actual expenditure** in thousands of national currency units for the reference year

SOURCE OF FUNDS	Total expenditure (1 = 2 + 4 + 5)	Intramural expenditure*			Extramural expenditure (transfers) (5)
		Current expenditure* (running costs)		Capital expenditure (investment) (4)	
		Totals (2)	of which staff* costs (3)		
1. **Government funds***					
Ministry of					
.....					
Ministry of					
.....					
Ministry of					
.....					
Public intermediary institutions					
.....					
.....					

SOURCE OF FUNDS	Total expenditure (1 = 2 + 4 + 5)	Intramural expenditure*			Extramural expenditure (transfers) (5)
		Current expenditure* (running costs)		Capital expenditure (investment) (4)	
		Totals (2)	of which staff* costs (3)		
Others (specify)					
TOTAL EXPENDITURE					
2. **Productive enterprise funds and special funds*** (a) **National enterprises*** (public or private)					
TOTAL EXPENDITURE					
(b) **Special funds***					
TOTAL EXPENDITURE					
(c) **Foreign or transnational enterprises***					
TOTAL EXPENDITURE					
3. **Foreign funds*** (a) **Bilateral co-operation**					
TOTAL EXPENDITURE					
(b) **Multilateral co-operation**					
TOTAL EXPENDITURE					

SOURCE OF FUNDS	Total expenditure (1 = 2 + 4 + 5)	Intramural expenditure*			Extramural expenditure (transfers) (5)
		Current expenditure* (running costs)		Capital expenditure (investment) (4)	
		Totals (2)	of which staff* costs (3)		
4. **Other funds** (a) Own funds of the Institution (b) Endowments and gifts (c) Other (specify)					
TOTAL EXPENDITURE					
TOTALS					

B. **Total intramural expenditure*** **(Sum of Columns (2) + (4))**

(a) Total intramural expenditure* on S&T activities (R&D and STS) .....

(b) Approximate percentage of which is allocated only to R&D ..... %

ZONE FOR CODING ANSWERS

1 0 5 (5/9 – 11)

Source of funds	(1)	(2)	(3)	(4)	(5)
12 – 14	15 – 18	19 – 21	22 – 24	25 – 27	28 – 30
31 – 33	34 – 37	38 – 40	41 – 43	44 – 46	47 – 49
50 – 52	53 – 56	57 – 59	60 – 62	63 – 65	66 – 68

1 0 6 (9 – 11)

12 – 14	15 – 18	19 – 21	22 – 24	25 – 27	28 – 30
31 – 33	34 – 37	38 – 40	41 – 43	44 – 46	47 – 49
50 – 52	53 – 56	57 – 59	60 – 62	63 – 65	66 – 68

1 0 7 (9 – 11)

12 – 14	15 – 18	19 – 21	22 – 24	25 – 27	28 – 30
TOTALS	31 – 35	36 – 39	40 – 43	44 – 47	48 – 51

Total intramural expenditure (52 – 56) Percentage allocated to R&D (57 – 59)

ZONE FOR CODING ANSWERS

IV. Material and data-processing ressources of the Institution

A. Buildings and Land

1. Used exclusively by the Institution for R&D and/or STS activities*

   (a) Premises (in sq. metres of useable space)

   ..... m^2 60 64

   (b) Experimental stations (in hectares of useable land)..... ha 65 67

   (N.B. 1 ha = 10,000 m^2)

2. Used exclusively for **other** activities of the Institution

   (a) Premises (in sq. metres of useable space)

   ..... m^2 68 72

   Specify use.....

   (b) Land (in hectares).....ha 73 75

   Specify use.....

B. Equipment (excluding computers recorded below)

Make a list of the major scientific equipment (i.e. worth US $5,000 or more) available in the Institution whose useful life-time is—or will be—at least 5 years. Give the cost value of each piece of equipment in thousands of **national currency** units, the country of origin and the year of acquisition (add a separate sheet if necessary).

	Name of the equipment	Country of origin	Cost value	Year of acquisition
(a)	.....	.....	.....	19.....
(b)	.....	.....	.....	19.....
(c)	.....	.....	.....	19.....
(d)	.....	.....	.....	19.....
(e)	.....	.....	.....	19.....
(f)	.....	.....	.....	19.....
(g)	.....	.....	.....	19.....
(h)	.....	.....	.....	19.....
(i)	.....	.....	.....	19.....
(j)	.....	.....	.....	19.....

ZONE FOR CODING ANSWERS

1 0 8 (7/9 11)

12 14 | 15 17 | 18 21 | 22 23
24 26 | 27 29 | 30 33 | 34 35
36 38 | 39 41 | 42 45 | 46 47
48 50 | 51 53 | 54 57 | 58 59
60 62 | 63 65 | 66 69 | 70 71

1 0 9 (8/9 11)

12 14 | 15 17 | 18 21 | 22 23
24 26 | 27 29 | 30 33 | 34 35
36 38 | 39 41 | 42 45 | 46 47
48 50 | 51 53 | 54 57 | 58 59
60 62 | 63 65 | 66 69 | 70 71

ZONE FOR CODING ANSWERS

C. COMPUTERS

1. Main-frame computers

1 1 0 (9/9 11)

(a) Does your Institution possess its *own* main-frame computer. (Draw a circle around the code of the appropriate answer.)

0 = No (12)

1 = Yes, purchased

2 = Yes, leased

If No, go to Question 4, (b)

If Yes, specify:

(i) the type and serial number.....
..... (13 26)

(ii) the country of origin .....
..... (27 29)

(iii) the year of acquisition 19..... (30 31)

(iv) cost of purchase or lease (in thousands of national currency units) .....
..... (32 35)

(v) weekly total utilization time of the computer (in machine-hours).....
..... (36 38)

ZONE FOR CODING ANSWERS

(b) Does your Institution make use of a main-frame computer belonging to an outside institution? (Draw a circle around the code corresponding to your answer.)

1 = Yes 0 = No ⌊_⌋ 39

If No, go to No. 2 "Personal computers".

If Yes, state:

(i) the name and address of that Institution ..... ⌊_____⌋ 40–49

..... ⌊_____⌋ 50–59

..... ⌊_____⌋ 60–69

..... ⌊_____⌋ 70–80

(ii) the type and serial number of the main-frame computer used ..... ⌊1 1 1⌋ 9–11

..... ⌊_____⌋ 12–25

(iii) the annual budget allocated by the Institution to outside data-processing operations in thousands of national currency units for reference year) ..... ⌊____⌋ 26–29

2. **Personal computers**

Total number of personal computers in the Institution

..... ⌊___⌋ 30–32

V. **Informational resources* of the Institution.** (Scientific and Technological Information and Documentation* (STID)

1. Is the Institution itself a STID Centre or Service? (Draw a circle around the code of the appropriate answer.)

1 = Yes, go to Question V.2 below

0 = No, go to Question V.4. ⌊_⌋ 33

2. Nature and quantity of the Institution's informational resources

(a) number of books ..... ⌊_____⌋ 34–38

(b) number of periodicals..... ⌊___⌋ 39–41

(c) number of microforms ..... ⌊_____⌋ 42–46

(d) other (specify)

.... ⌊____⌋ 47–50

(e) other (specify)

.... ⌊____⌋ 51–54

ZONE FOR CODING ANSWERS

3. STID activities of the Institution during the reference year.
Put an 'X' in the boxes corresponding to the activities carried out:

☐ on the spot consultations — 55

☐ outside loans — 56

☐ reproductions — 57

☐ compilation of bibliographies on request — 58

☐ other (specify)

..... — 59

☐ other (specify)

..... — 60

N.B. If the Institution is exclusively a STID Centre or Service, your answer stops here. If not, go to Question V.4 below.

4. Does your Institution possess its own library? (Draw a circle around the code of the appropriate answer.)

1 = Yes 0 = No — 61

If Yes, specify:

(a) the number of books..... — 62–66

(b) the number of subscriptions to periodicals ..... — 67–70

5. Does your Institution call on one or more outside STID Centres or Services? (Draw a circle around the code of the appropriate answer.)

1 = Yes 0 = No — 71

If Yes, list below the names and addresses of these centres or services — 1,1,2 (9–11)

(a) ..... — 12–31

..... — 32–51

..... — 52–71

..... — 72–80

1,1,3 (9–11)

(b) ..... — 12–31

..... — 32–51

..... — 52–71

..... — 72–80

ZONE FOR CODING ANSWERS

1 1 4
9 11

(c) .....
12 31

.....
32 51

.....
52 71

.....
72 79

6. Does your Institution make use of the services of a STID specialist? (Draw a circle around the code corresponding to your answer.)

1 = Yes 0 = No

13/80

* * *

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SURVEY OF CARIBBEAN SCIENTIFIC AND TECHNOLOGICAL POTENTIAL (STP)

QUESTIONNAIRE NO. 2

	Yes
RESEARCH OR EXPERIMENTAL DEVELOPMENT PROJECT (R&D)	☐
OR	
SCIENTIFIC AND TECHNOLOGICAL SERVICE ACTIVITY (STS)	☐

N.B.

1. This questionnaire *should be completed* by the principal person in charge of *each R&D project or STS activity.* Put a cross in the box above corresponding to the subject. R&D project* or STS activity.* (Use several forms if necessary, one per project or activity).
2. This questionnaire should therefore *not be completed* by scientific or technological services working only on a permanent and continuous basis, without time-limitations for any of their activities (see Definitions of R&D project and STS activity, Item 3 below).
3. Terms marked with an asterisk (*) in the text are defined in the 'Definitions and Instructions' accompanying this questionnaire.
4. Do not write anything in the boxes entitled 'Zone for coding the answers on completion of the questionnaire'. These are to be filled in by the analysts/ interviewers.
5. The annexes Q/Annex 1, Q/Annex 2, should accompany this questionnaire.

Part to be completed by the organization carrying out the STP survey.

Name of organization .....

Name of interviewer :.....

Date received: .....

Date coded: .....

Date checked: .....

Date transcribed: .....

ZONE FOR CODING THE ANSWERS ON COMPLETION OF THE QUESTIONNAIRE

Country: .....

Reference Year:* 19.....

I. **General information.**

1. Institution* (or Organization) in which the R&D project* or STS activity* is being carried out. (Check with the head of Institution) .....

.....

.....

2. Name of principal S&T Unit* responsible for the R&D project or STS activity within the Institution. (Check with the head of Institution) .....

.....

.....

3. Name of the project-head, or principal person in charge of the STS activity .....

.....

.....

.....

4. Title of the R&D project or STS activity (underline key words).....

.....

.....

.....

.....

ZONE FOR CODING ANSWERS UPON COMPLETION OF QUESTIONNAIRE
(leave blank)

Title 202

Title continued 203

ZONE FOR CODING ANSWERS

5. Scientific or technological objectives of the R&D project or STS activity. (Underline key words.)

2 0 4 (9–11)

.....

.....

..... (17–36)

..... (37–56)

..... (57–76)

..... (77–80)

6. If the R&D project or STS activity forms part of a 'Programme',* give the name of the principal sponsoring organizations or institutions (including yours if that is the case).

2 0 5 (9–11)

(a) ..... (17–19)

..... Country ..... (20–22)

(b) ..... (23–25)

..... Country ..... (26–28)

(c) ..... (29–31)

..... Country ..... (32–34)

7. Disciplines of science and technology to which the R&D projects or STS activity belongs (maximum 2 disciplines in order of importance, to be chosen from the nomenclature proposed by Unesco, cf. Annex 1)

(a) ..... (35–38)

(b) ..... (39–42)

8. Socio-economic aims* to the attainment of which the R&D project or STS activity is particularly likely to make a contribution: list, in order of importance, a maximum of 2 aims to be chosen from the list appearing in Annex 2

(a) ..... (43–44)

(b) ..... (45–46)

9. Target group likely to benefit from the results of the R&D project or STS activity. (Draw a circle around the code corresponding to your answer.)

1 = rural 2 = urban 3 = both (47)

10. Geographical bearing of the R&D project or STS activity.
Use the following scale to modulate your answer:

0 = none; 1 = slight; 2 = moderate; 3 = high

ZONE FOR CODING ANSWERS

(a) Worldwide ... 48

(b) Regional (Caribbean) ... 49

(c) National only ... 50

11. Linguistic areas in the Caribbean concerned by the R&D project or the STS activity. (Put a cross in the corresponding box(es)

☐ English 51

☐ Spanish 52

☐ French 53

☐ Other (specify) 54

12. State of progress of the R&D project or STS activity. (Draw a circle around the code corresponding to your answer)

1 = at the planning stage 55

2 = operational

3 = interrupted

4 = abandoned

5 = completed (give the date) ..... /19..... 56 59

(month) (year)

II. Human resources of the R&D project or STS activity.

13. Scientific and technical personnel participating in the R&D project or STS activity

(a) number of scientists and engineers* in full time equivalent (FTE)* 60 61

Give also the names of the five most important persons among them from the point of view of their substantial contribution to the R&D project or STS activity and the percentage of their time devoted to the project or activity.

	Names	Percentage	
(i)	.....	.....	62 64
(ii)	.....	.....	65 67
(iii)	.....	.....	68 70
(iv)	.....	.....	71 73
(v)	.....	.....	74 76

ZONE FOR CODING ANSWERS

(b) number of technicians* participating in the R&D project or STS activity (this should be expressed in full-time equivalent,* if some technicians are engaged in several projects or activities).....

77 78

(c) number of auxiliary personnel* participating in the R&D project or STS activity (should be expressed in full-time equivalent as above) .....

79 80

III. Financial resources of the R&D project or STS activity

14. Show total funds allocated to the R&D project or STS activity from beginning to end, and total expenditure obligated during the reference year.* This information should be provided for each source of funds for the R&D project or STS activity and should be expressed in thousands of national currency units.

2 0 6

9 11

Source of funds	Total funds allocated to the R&D project or STS activity	Total funds obligated in reference year
(1)	(2)	(3)
(a) **Government funds***		
.....	.....	.....
.....	.....	.....
.....	.....	.....
(b) **Special funds***		
.....	.....	.....
.....	.....	.....
.....	.....	.....
(c) **Productive enterprise funds***		
.....	.....	.....
.....	.....	.....
.....	.....	.....
(d) **Foreign funds***		
.....	.....	.....
.....	.....	.....
.....	.....	.....
(e) **Other funds***		
.....	.....	.....
.....	.....	.....
.....	.....	.....
TOTAL	.....	.....

17 19 20 23 24 27

28 30 31 34 35 38

39 41 42 45 46 49

50 52 53 56 57 60

61 63 64 67 68 71

72 75 76 79

ZONE FOR CODING ANSWERS

IV. **Duration of R&D project or STS activity —Evaluation**

15. Duration of the R&D project or the STS activity — 2 0 7 (9–11)

(a) Starting date:

month:..... year: 19 ..... (17–20)

(b) Scheduled completion date:

month:..... year: 19 ..... (21–24)

16. Forthcoming evaluations of the state of progress of the R&D project or STS activity

(a) month:..... year: 19 ..... (25–28)

(b) month:..... year:19 ..... (29–32)

N.B.
If your answer to this questionnaire concerns an R&D project, please answer the questions in the following section. If not, stop here.

PART CONCERNING R&D PROJECTS ONLY

1. Type of research or experimental development (R&D). (Draw a circle around the code corresponding to your answer)

1 = fundamental research*

2 = applied research* (33)

3 = experimental development*

2. Likelihood of achieving the S&T objectives assigned to the R&D project. (Cf. Question 5 above, and draw a circle around the code corresponding to your answer)

1 = slight

2 = moderate (34)

3 = strong

within the time foreseen?

0 = No

1 = Yes (35)

* * *

UNDP/RLA/85/013

SURVEY OF CARIBBEAN SCIENTIFIC AND TECHNOLOGICAL POTENTIAL (STP)

QUESTIONNAIRE NO. 3

SCIENTIFIC WORKERS
(Scientists and engineers)*

N.B.
1. This questionnaire *should be completed* by all full-time and part-time personnel (scientists and engineers) working in the Institution.
2. Terms marked with an asterisk (*) in the text are defined in the 'Definitions and Instructions' accompanying this questionnaire.
3. Do not write anything in the boxes entitled 'Zone for coding the answers on completion of the questionnaire'. These are to be filled in by the analysts/ interviewers.
4. The annex Q/Annex 1 should accompany this questionnaire.

Part to be completed by the organization carrying out the STP survey

Name of organization: .....

Name of interviewer: .....

Date received: .....

Date coded: .....

Date checked: .....

Date transcribed: .....

ZONE FOR CODING THE ANSWER ON COMPLETION OF THE QUESTIONNAIRE

Country: .....

1 3

Reference year: 19.....

4 5

I. General

1. Institution* (or Organization) employing the respondent scientist/engineer.* (Check with the head of Institution) .....

6 8

.....

3 0 1

9 11

2. Name of the S&T Unit* (R&D or STS*) in the Institution to which the respondent belongs. (Check with the head of Institution.)

12 14

.....

.....

15 16

3. Name and first name of the respondent .....

17 36

.....

37 56

.....

57 76

.....

77 80

3 0 2

9 11

4. Nationality .....

17 19

5. Sex (draw a circle around the corresponding code)

1 = male 2 = female

20

6. Year of birth: 19.....

21 22

7. Number of years of full-time education and training since the first year of primary school, (including years of post-graduate study and years of research leading to a doctorate, but not including repeated years) .....

23 24

8. In the table provided below, list in chronological order:

   (a) Acronym(s) of diploma(s) or degree(s) obtained by the respondent;

   (b) scientific/technological field of specialization of diploma or degree (enter the corresponding four-digit code to be chosen from the nomenclature proposed by Unesco, cf. Annex 1);

   (c) the year in which they were awarded;

   (d) the name of the institution that awarded the diploma or degree;

   (e) the issuing country.

	(a) Diploma or Degree	(b) S&T field	(c) Year	(d) Institution	(e) Country
(i)	.....	.....	19.....	.....	.....
(ii)	.....	.....	19.....	.....	.....
(iii)	.....	.....	19.....	.....	.....
(iv)	.....	.....	19.....	.....	.....
(v)	.....	.....	19.....	.....	.....

ZONE FOR CODING ANSWERS

	(a)	(b)	(c)	(e)
(i)	25 26	27 30	31 32	33 35
(ii)	36 37	38 41	42 43	44 46
(iii)	47 48	49 52	53 54	55 57
(iv)	58 59	60 63	64 65	66 68
(v)	69 70	71 74	75 76	77 79

ZONE FOR CODING ANSWERS

9. Scientific/technological field of occupational specialization (maximum 2 disciplines, in decreasing order of importance, to be chosen from nomenclature proposed by Unesco, Cf. Annex I)

   (a) 3 0 3 (9 11)

   (b) ..... (17 20)

   (21 24)

10. Level of administrative responsibility.* Three levels are distinguished. (Draw a circle around the code corresponding to the highest level at which the respondent exercises responsibility.)

    3 = Organization or institution

    2 = Section, department, faculty or experimental station

    1 = S&T Unit

    0 = Does not exercise any administrative responsibility.

    (25)

11. Level of scientific and technical responsibility.* (Draw a circle around the code corresponding to the highest level at which the respondent exercises responsibility.)

ZONE FOR CODING ANSWERS

2 = Principal person in charge of a scientific or technological programme* (R&D or STS)*

1 = Principal person in charge of an R&D project* or scientific or technological activity* ⌊_⌋ 26

0 = Neither one nor the other.

12. Legal status of your employment. (Draw a circle around the code corresponding to your answer.)

1 = Staff member in service

2 = Seconded staff member

3 = Staff member not on manning table

4 = Staff member of unspecified status

5 = Employed under contract ⌊_⌋ 27

6 = Fellowship holder, doctoral student or trainee

7 = Foreign specialist employed under a co-operation scheme

8 = Other (specify) .....

13. Were you actively employed in the Unit on 31 December 1985. (Draw a circle around the code corresponding to your answer.)

1 = Yes 0 = No ⌊_⌋ 28

14. Proportion of time allotted to different activities during reference year. Please assess as exactly as possible the percentage of your working time devoted to the following activities: (the sum of the percentages should equal 100)

(a) Research and experimental development* (R&D) .....% ⌊_⌋ 29 31

(b) Scientific and technological service activities* (STS) .....% ⌊_⌋ 32 34

(c) Teaching .....% ⌊_⌋ 35 37

(d) Purely administrative tasks .....% ⌊_⌋ 38 40

(e) Other professional activities (specify) .....% ⌊_⌋ 41 43

.....

TOTAL 100%

N.B.
If your reply to Question 14 (a) is zero your answer stops here.

ZONE FOR CODING ANSWERS

II. For 'scientific researchers'* only

1: Function in the Institution. (Draw a circle around the code corresponding to your answer.)

1 = Head of Institution

2 = Head of a S&T Unit*

3 = Qualified researcher, staff member of the Institution

4 = Trainee researcher

5 = Doctoral student

6 = Other (specify) .....

.....

[ ] 44

2. Time spent in R&D, in number of years (fractions may be used when applicable) ....

[ ] 45 47

3. Time spent on research performed in ecological zones comparable to that of this country, in number of years (fractions may be used when applicable) .....

[ ] 48 50

4. Year of first appointment in R&D activities, in this country: 19.....

[ ] 51 52

5. Are you preparing a doctoral thesis? (Draw a circle around the code corresponding to your answer.)

1 = Yes 0 = No

[ ] 53

If No, go on to Question II.6

If Yes, specify:

(a) The level of that thesis. (Draw a circle around the code corresponding to your answer.)

1 = Ph.D.

[ ] 54

2 = Other (specify) .....

(b) Subject of the thesis (underline key words)

[ ] 55 74

.....

[ ] 75 80

.....

3 0 4
9 11

.....

[ ] 17 36

.....

[ ] 37 56

.....

[ ] 57 76

.....

[ ] 77 80

ZONE FOR CODING ANSWERS

6. Number of months of service (including statutory leave) during the reference year — 3 0 5 (9–11)

(17–18)

7. Number of works and articles in the fields of science and/or technology published under your name alone or with others during the reference year. Attach a list of bibliographical references, theses included:

(a) in the country ... (19–20)

(b) abroad ... (21–22)

8. Number of patents taken out under your name or with others during the reference year. Attach a list of bibliographical references, country, number, etc.

(a) in the country ... (23–24)

(b) abroad ... (25–26)

9. Number of meetings on science and technology, including symposia, seminars, conferences, etc., in which you participated during the reference year, excluding however meetings organized within your own institution:

(a) in the country ... (27–28)

(b) abroad ... (29–30)

10. List of honorific distinctions* awarded to you on account of your scientific/technological works, as of today:

(a) ..... (31–32)

..... Country: ..... (33–35)

(b) ..... (36–37)

..... Country: ..... (38–40)

(c) ..... (41–42)

..... Country: ..... (43–45)

(d) ..... (46–47)

..... Country: ..... (48–50)

* * *