Rwanda needs the skills, knowledge and attitudes to support the transition to a middle income country

Republic of Rwanda

Ministry of Public Service and Labour

SKILLS AREA AND NUMBERS OF PRIORITY SKILLS REQUIRED ACROSS RWANDA

FIVE YEAR PROGRAM FOR PRIORITY SKILLS DEVELOPMENT TO DELIVER EDPRS II (2013 - 2018)

MIFOTRA ***NCBS***

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I. INTRODUCTION

The Government of Rwanda recognizes the need for qualified and skilled human resources to address the imbalance in the supply and demand of skilled labour and is committed to ensuring that there are skilled workers available on the labour market to meet the actual labour market demands. Whereas progress has been made over the previous 19 years in the areas of education and skills development in Rwanda, significant barriers still remain, creating challenge of matching of skills and opportunities in the labour market.

It has therefore become imperative to depart from the traditional way of capacity building to a more strategic and focused approach that is aimed at achieving national priorities. A Five Year Program for skills development to deliver EDPRS II (2013-2018) in this regard has been developed to address the critical and scarce skills gap in the following high priority sectors: (i) Infrastructure; (ii) Agriculture; (iii) Natural Resources; (iv) Investment, Trade and Industry (v) ICT; (vi) Health and (vii) Education.

The Study has revealed that highly skilled labour is needed to help address identified sector specific needs – particularly at the technician and professional levels in the aforementioned Sectors. To resolve the current status, the Program envisages more focus on science and technology skills and includes several strategies to address identified gaps.

In this endeavor, much more focus on resource sharing and qualifications design will be required from the education and training system to deliver on set priorities. Interagency (government departments) and industry sectors' cooperation (through public private partnerships) will be required in most aspects to make this program a resounding success.

The Government of Rwanda has committed seed money funds to the development of a more robust and accessible education. But this program will be achieved only with a vibrant private sector and high commitment of Development Partners and other Stakeholders.

It also should be pointed out that continual and increased commitment of students/trainees, parents and corporates will be required over the period to address the identified skills needs in priority sectors. Private investment in skills development will result in increased national capacity, job opportunities for the youth, and increased private sector competitiveness while ensuring the value for money.

In order to implement the Five Year Program for skills development, the following policy actions have been taken:

- Put in place the National Capacity Building Secretariat (NCBS) to coordinate implementation of Capacity Building activities in the public, private and civil society sectors to mitigate overlaps and duplication of effort;

- Establish a high level National Steering Committee to oversee the implementation of the Five Year Program for skills development in priority sectors;
- Put in place mechanism for private sector investment in priority skills development;
- Prioritize scholarships for high flyers in priority sectors;
- Securing fees waivers from reputable training providers in priority areas;
- Initiate Twinning Arrangements & Partnerships between Local institutions and International /Regional institutions with priority skills for Best Practices and Knowledge Management;
- National Commission for Science and Technology (NCST) in collaboration with relevant institutions, to monitor the progress and performance of Rwandans undergoing training in areas of science and technology; and advise the government on strategic and relevant placement of trainees in areas of science and technology;
- Strengthen the operations of the Labour Market Information System to take on an overarching and long term perspective;
- Put in place a National Qualification and Competency Framework;
- Prepare an annual sector capacity building plan that is based on needs assessment conducted every five years;
- Establish Technology and Business Incubation Facilities in the Science &Technology oriented institutions of higher learning in Rwanda;

- Empower National Training Institutions to effectively offer courses in both priority skills and specialised skills;
- Create National Centres of Excellence and Decentralize academic faculties in priority skills.

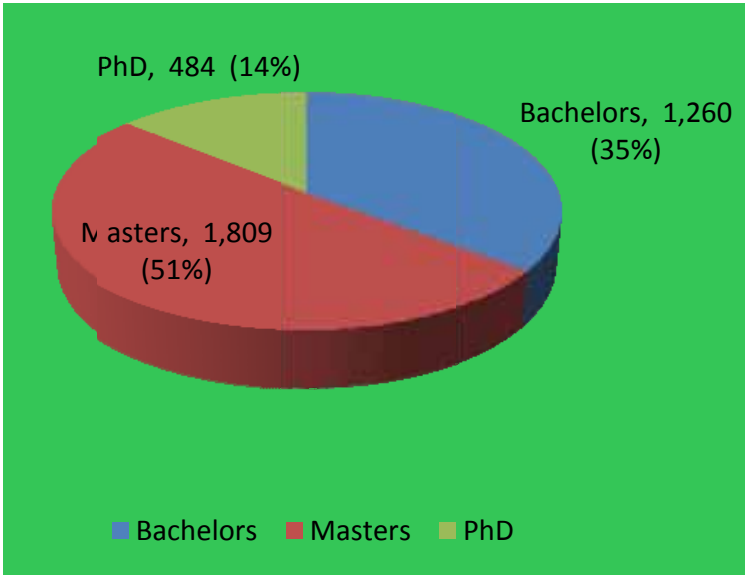
In the next 5 years, the approved strategies and policy actions under this program will help make a significant headway the availability of knowledgeable, skilled and resourceful individuals who contribute to successful achievement of development objectives set out in the Vision 2020, the Economic Development and Poverty Reduction Strategy (EDPRS); and particularly the supply of the required skills in the labour market.

The soft skills required by the priority sectors and other sectors that have not been captured shall mainly be provided by Rwanda Management Institute (RMI) or an other reputable training provider that has the dedicated profile and mandate.

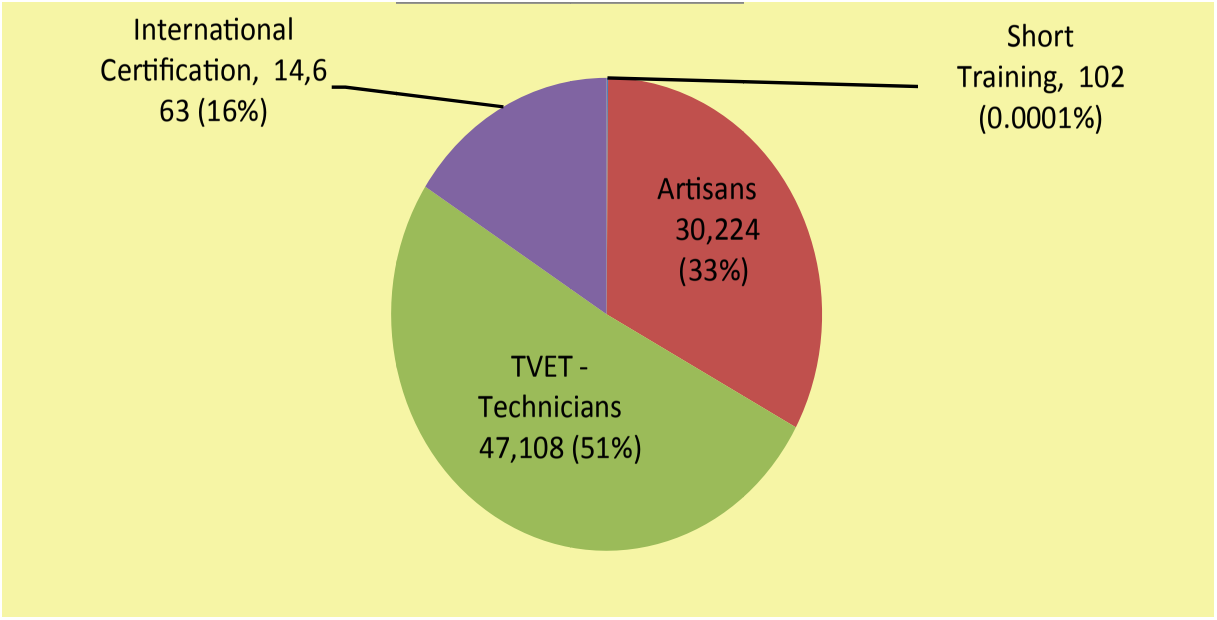
II. FIVE YEAR PROGRAM FOR PRIORITY SKILLS DEVELOPMENT AT A GLANCE

The following summary of aggregated information on the critical skills gap in the Priority Sectors as mentioned above indicates the required number of skills per level from 2013 to 2018.

A. Required number of skills by graduate level (2013-2018)



B. Required number of skills at the level of technicians, artisans, short term and specialized training (2013-2018)



Briefly the following can be noted:

- Education Sector has 96% of all PhDs' needs;
- For Master's : Infrastructure Sector (37%), Education (25%), (19%), Health (21% MMED);
- Professional certification/International certificate: ICT (92%);
- TVET Technician: Infrastructure Sector (65%);
- Artisans: Agriculture (65%).

The developing of quality and adequate skilled human resources will be the key towards achieving desired levels of economic growth; reducing the rate of poverty; economic transformation; rural development; productivity and youth employment, and accountable governance for EDPRS II.

As highlighted in the following table showing priority skills arranged along with thematic areas of the EDPRS II, for the period of 2013-2017, 119,445 total numbers of skills are required to deliver EDPRS II.

EDPRS II target for 2017		
Priority Areas Arranged along with thematic areas of the EDPRS II		Targets for 2017
1	Economic Transformation	46, 832
2	Rural Development	35, 269
3	Productivity and Youth Employment	29,918
4	Accountable Governance	7,426
TOTAL		119,445

Source: Ministry of Education, Presentation on Required Human Resource Capacity Development to implement EDPRS II, Gabiro Leadership Retreat 28th – 30th March 2013.

The required number and types of skills identified along with thematic areas were obtained by aggregating all priority skills gap in the Priority Sectors respectively under the thematic area in which they belong to.

III. SKILLS AREA AND NUMBER OF SKILLS REQUIRED PER LEVEL

3.1 Skills area and Number of Skills required in Infrastructure Sector

FINAL ANALYSIS

	Masters	Bachelors	Specialised Training	Technicians
Air Transport	**14**	**106**	**759**	**468**
Aeronautical	8	29	140	
AIR TRAFFIC SERVICES (ATS)	2	20	58	
Air Transport			334	468
AIRPORT MANAGEMENT	4	47	227	
Aviation		10		
Construction	**292**		**33**	**20480**
Bridge Construction	112			1680
Construction	180		33	18800
Meteology	**23**	**57**		
Meteology (Including Agrometeology)	23	57		100
Electricity Utility, Operation & Maintenance	**42**	**112**	**25**	**732**
Electromechanical Engineering	32	10	25	-

Infrastructure Sector cont'd

Energy Generation & Distribution	**189**	**300**	**190**	**3643**
Geothermal	11	60	150	300
Peat	20	70		250
Methane	35	40	25	1368
Hyrdopower	100	100		200
Solar Development & MGT	23	30	15	1525
Transport	**53**	**87**	**60**	**4340**
Marine Transport	10			50
Railway Transport	16	60	30	300
Road construction	13	27		3950
Transport Management	14		30	40
Urbanisation	**69**	**99**		
Urbanisation	69	99		
Water, Sanitation & Waste Management	**17**	**147**		**800**
Water Sewerage & Sanitation	12	117		800
Waste Management]	5	30		

Source: Five year skills development program to deliver EDPRS II, 2013

The following table give details on skills that are required in the Air Transport :

Skills Area	Number
Turbo prob first officers	6
Licensed 737-700/800ng pilots & first officers	32
Licensed CRJ 900 Pilots & First Officers	12
licensed B787 Dreamliner Pilots & First Officers	24
Aircraft Engineers -Airframe & Powerplant	14
Aircraft Engineers - Avionics	8
Aircraft Technician - Airframe & Powerplant	6
Aircraft Technicians- Avionics	2
GSE Technicians	5
Support Staff	20
Certifying Engineers	6
Unlicensed Engineers	10
Certifying Engineers	6

Skills Area	Number
Unlicensed Engineers	10
Certifying Engineers	12
GSE Technicians	12
Machine and Equipment Technicians	10
Quality Assurance Engineering services	1
Audit Skills in Ground Operations and Passenger handling	1
Oversight and Monitoring of Security Services	2
Oversight and Monitoring of Cargo Operations Services	2
Oversight and monitoring of Cabin Services	1
Safety Management System	5
Interline Accounting	10

3.2 Skills area and Number of Skills required in Agriculture Sector

The priority skills areas that have been reported include the following:

Sub Skills Area	Nbr	Level
Animal Nutrition & Feed Sciences	1	Masters
Applied Veterinary Parasitology	1	Masters
Clinical Pathology & Laboratory Diagnostics	1	Masters
Dry-land Resource Management	2	Masters
Agricultural Information & Technology and Management	1	Masters
Agricultural Resource Management	1	Masters
Leather Science & Technology	1	Masters
New Chain Promotion expert	2	Masters
Agriculture Material Mechanical engineers	5	Masters
Agriculture Material Mechanical technicians	4	Masters
Agricultural Resource Management	2	Masters
Socio-economist	4	PhD
Agro-environmental and soil management	10	Masters

Agriculture Sector Cont'd

Sub Skills Area	Nbr	Level
Food and crop biotechnology	20	Masters
Food Processing	1	Masters
Agro Processing Technicians	400	Technicians
Agro-processing and packaging	1	Masters
Animal Nutrition & Feed Sciences	4	Masters
Animal Nutrition	1	Masters
Animal Production Senior Researcher	2	PhD
Apiary	1	Masters
Apiary Specialist	1	Masters
Aquaculture Specialist	1	Masters
Artisans animal breeding, production and treatment	10000	Artisans
Artisans plant specialized zone	15000	Artisans
Bacteriology	1	PhD
Biotechnology Senor Researcher	3	Masters

Agriculture Sector Cont'd

Sub Skills Area	Nbr	Level
Coffee extensions	60	Bachelors
Coffee extensions	12	Masters
Coffee Processing	1	Masters
Coffee production & Research	4	Masters
Dairy Value Chain	2	Masters
Entomology Protozoology		Masters
Epidemic Disease Control	1	PhD
Epidemiology Specialist	1	PhD
Fish and Fish Farming	2	Masters
Fisheries and Aquaculture Management	1	Masters
Fish and bee farming	45	Technicians
Fisheries and Aquaculture Management	5	Masters
Food Safety and Security	1	Masters
Forest and Green Environment	1	Masters
Forestry and Agroforestry Senior Researcher	3	Masters

Agriculture Sector Cont'd

Forestry & Agroforestry	60	Technicians
Forestry and Ecosystem Conservation	8	Masters
Genetic Improvement	1	Masters
Hatchery	1	Masters
Hatchery Technicians	1	Masters
Helminthology	1	PhD
Horticulture processing	3	Masters
Horticulture production support	5	Masters
Innovation and transformation expert	1	PhD
Pyrethrum Technician	5	Bachelors
Horticulture Specialist	4	Masters
Irrigation and Water Engineering	45	Bachelors
Marshland Development, Irrigation &Water Management Specialist	5	Masters

Agriculture Sector Cont'd

Irrigation &Water Management	1	Masters
Irrigation Engineer	2	Masters
Clinical Pathology & Laboratory Diagnostics	15	Masters
Laboratory Technician	1	Masters
Large and Small Stock	1	Masters
Leather Science & Technology	2	Masters
Liquid Nitrogen Plant Operator	1	Masters
Maize Specialist	1	Masters
Machine Reparation and Spare parts	500	Technicians
Mechanization Specialist	30	Bachelors
Mechanization Engineers	1	Masters
Monogastrics &Rabbits Specialist	1	Masters
Pathology	1	PhD

Agriculture Sector Cont'd

Pest & Disease Surveillance	1	Masters
Plant health and Natural Forest	3	Masters
Plant Pathology	1	Masters
Post-Harvest Senior Researcher	5	Masters
Poultry	1	Masters
Rice Specialist	1	Masters
Roots and Tubers	2	Masters
semen production	1	Masters
Serology	1	PhD
Sericulture	2	Masters
Small Ruminants	1	Masters
Soil Conservation	1	Masters
Sorghum Specialist	4	Masters
Tea & Coffee Research	1	PhD

Agriculture Sector Cont'd

Tea Industrial Machinery	30	Technicians
Tea processing	2	Masters
Tea processing	1	Masters
Tea production support	2	Masters
Tractors, pumping stations and heavy machines operators	2	Masters
Comprehensive Veterinary Medicine	2	Masters
Veterinary Public Health & Meet Technology	2	Masters
Virology Specialists	1	PhD
Agro meteorology Specialist	2	Masters
Wheat Specialist	1	Masters
Workshop engineers	1	Masters

3.3 Skills area and Number of Skills required in Natural Resources Sector

FINAL TABLE: REQUIRED SKILLS IN NATURAL RESOURCES AND ENVIRORNMENT, 2013-2018						
Area	**PhD**	**Masters**	**Bachelors**	**Technicians**	**Artisans**	**TOTAL**
Mining Economists		5	5			10
Mining and Metallurgy Engineers		20	80	2512	4986	7618
Petrographer		7	15			22
Basin Analysis		3				3
Blasting Engineering		3	5	50		33
Environment, Geology, Rock and Natural resources	5					
Forest and Green Environment		10				10
Gelologists		10				10
Geochemists		10		10		10
Geomapping and Cartography		8				8
Geophysicists		5	20			25
Hydrology and Water Resources		5	30			35
Land Administration		4				4
Land Administration and Valuation		47				47
Land Surveying		10		100		110
Machine Opreators in Excavator, Bulldozer and			10	60		70
Mining Surveying		10				10
Mineral Processing		4	30			34
Ore Dressing Engineering		10	15			25
Petroleum Engineers		10	15			25
Petroleum Geochemists and Geophysics		15				15
Photogrammetry		4				4
Rock Mechanics and Engineering		5		60		65
Sedimentology		5	5			10
Tectonics		5	20			25
Water Resources and Sanitation		5	30			35
Wood Technicians				400		400
TOTAL	**5**	**240**	**275**	**3162**	**4986**	**8663**

3.4 Skills area and Number of Skills required in Trade, Industry, and Investment Sector

Area	Level	2013/14	2014/15	2015/16	2016/17	2017/18	TOTAL
Petroleum Industry, environmental, Chemistry , Biotechnologist	Masters	3	3	2	1	2	**11**
Material Analysts and Standards	Specialized Short Term Training	5	5	5	5	5	**25**
International Marketing and Contract	Masters	4	3	2	2	2	**13**
Certified International Investment Analyst.	Professional Certificate	7	5	3	2	2	**10**
Investment Regulation and Financial Analysis	Specialized Training	8	8	7	6	7	**36**
Industrial & Production Engineers	Engineers	39	20	28	16	7	**110**
Industrial & Manufacture Product, Machine, Labourers and Operators	Technicians	1077	970	1032	1013	193	**4,285**
Industrial & Manufacture Product, Machine, Labourers and Operators	Artisans	1505	1253	1052	806	608	**5,224**
Tourism Regulation (Tourism Policy & Research, Act and Bill Elaboration)	Masters	1	1	1	0	0	**3**
Tourism and Hospitality Tourist Translator, guide, food, cook, etc	Technicians	283	233	192	181	164	**1,053**
International Trade & Economics, Industry Project Development	Masters	5	6	5	4	2	**22**
Commercial Arbitration and Trade Promotion	Specialized Short Term training	6	6	6	6	3	**27**
Total		**2,936**	**2,508**	**2,332**	**2,040**	**993**	10,809

3.5 Skills area and Number of Skills required in ICT Sector

	Number		
Skill Area	**Associate**	**Professional**	**Expert**
Network Security	245	99	39
Wireless & Transmission Security	96	66	36
Application Security	320	162	81
Security Audit			154
Information Security Manager			78
System Administrator	406		
Linux System Specialist			308
Windows System Specialist			227
Storage Specialist			79
Network Administor	454	310	254
IP Network Engineer	234	157	81
Fiber Engineers			227

ICT Sector cont'd

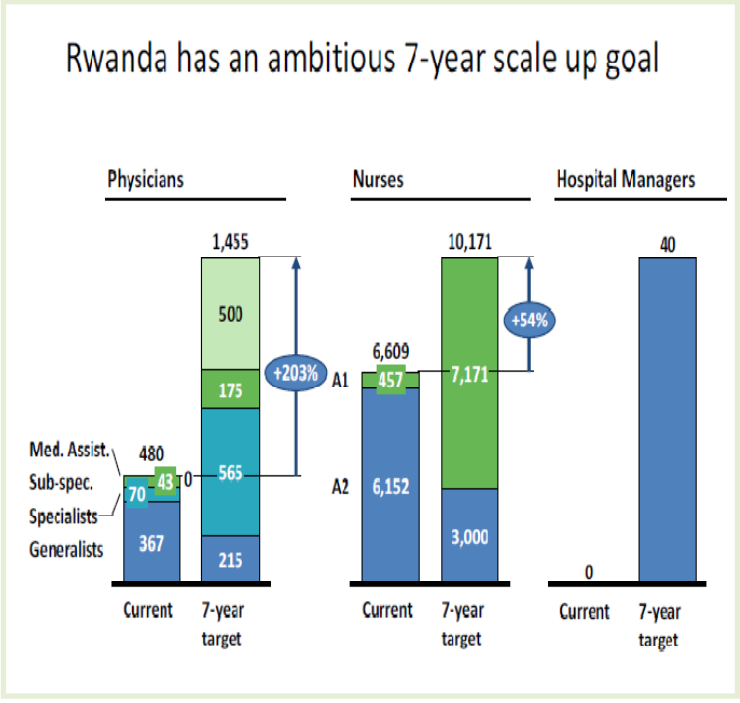
	Number		
Skill Area	**Associate**	**Professional**	**Expert**
Wimax Specialist			112
Voice Engineer	135	206	96
Data Center Management			85
Radio Frequency Planning Specialist;			148
Radio Transmission Specialists;			274
Telecommunication network switching specialist;			169
Telecommunication Network Performance Optimization Specialist;			148
Database Adminstrator	365	243	162
WebMaster	260		
Graphic Designers			700
Multimedia Specialist			519

ICT Sector cont'd

	Number		
Skill Area	**Associate**	**Professional**	**Expert**
Game designing and development			160
Industrial Designers			106
Website Developer			227
Software Developers	811	438	316
Mobile Applications Developer			876
Business Analyst			373
Enterprise Architect			389
IT Project Managers			292
Online work skills	1,800		

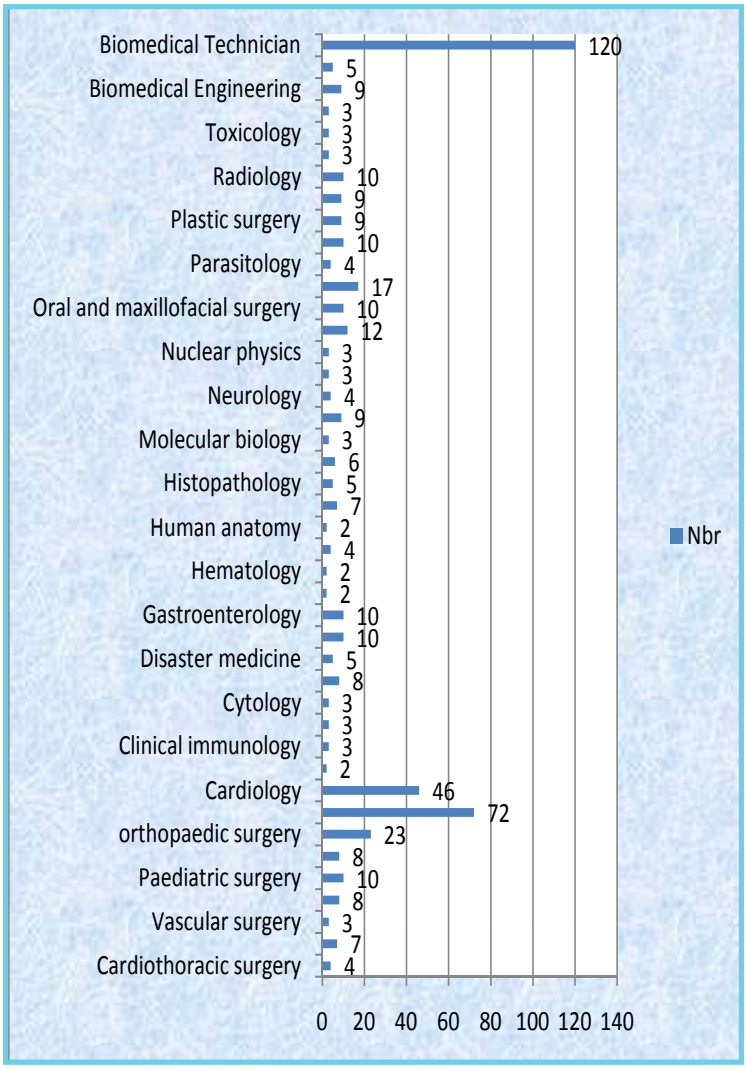
3.6 Skills area and Number of Skills required in Health Sector

It is stipulated in the Vision 2020 that 10 medical doctors, 20 nurses, and 5 lab assistants are required for every 10,000 inhabitants.



In the health sector, there is a critical need to train 373 Doctors at Specialist level through facilitating them to pursue Master's degree in/ or with a speciality in the following areas: cardiac surgery, intensive care, Vascular surgery, Neurosurgery, Pediatric surgery, Urology, orthopedics surgery, Anesthesiology, Cardiology, Cytology, Dermatology, Disaster medicine, Endocrinology, Gastroenterology, Medical genetics, Hematology, Anatomy, internal medicine with a sub speciality in Infectioulogy, Histopathology, Oncology, Internal Medicine, Molecular Biology, Nephrology, Neurology, Nuclear Medicine, Nuclear Physics, Ophtamology, Oral and Maxillofacial Surgery, ENT, Parasitology, Pediatrics, Pediatrics with speciality in Neonatology, Nuclear medicine, Plastic Surgery, Pulmonology, Radiology, Rheumatology, Toxicology, Virology, Psychiatrics and Dentistry.

Health Sector cont'd



Health Sector cont'd

Area	Level	Nbr
Cardiothoracic surgery	MMED in Surgery with a sub specialty in cardiac surgery	4
Intensive care medicine	MMED (Specialist in intensive care Medicine)	7
Vascular surgery	MMED in Surgery with a sub specialty in Vascular surgery	3
Neurosurgery	MMED in Surgery with a sub specialty in Neurosurgery	8
Paediatric surgery	MMED in Surgery with a sub specialty in paediatric surgery	10
Urology	MMED in Surgery with a sub specialty in Urology	8
orthopaedic surgery	MMED in Surgery with a sub specialty in orthopaedic surgery	23
Anaesthesiology	MMED in Anaesthesiology	72
Cardiology	MMED in Internal Medicine with a sub specialty in Cardiology	46
Clinical biochemistry	MMED in Clinical biochemistry	2
Clinical immunology	MMED in immunology	3

Health Sector cont'd

Area	Level	Nbr
Clinical microbiology	MMED in Microbiology	3
Cytology	MMED in Cytology	3
Dermatology	MMED in Dermatology	8
Disaster medicine	MMED with a specialty in Disaster medicine	5
Endocrinology	MMED in Endocrinology	10
Gastroenterology	MMED in Internal Medicine with a sub specialist in Gastroenterology	10
Medical genetics	MMED in Medical genetics	2
Hematology	MMED in Hematology	2
Hepatology	MMED in Internal Medicine with a sub-specialty in Hepatology	4
Human anatomy	MMED in Anatomy	2
Infectious diseases	MMED in Internal Medicine with a sub specialist in Infectioulogy	7
S/Total		**242**

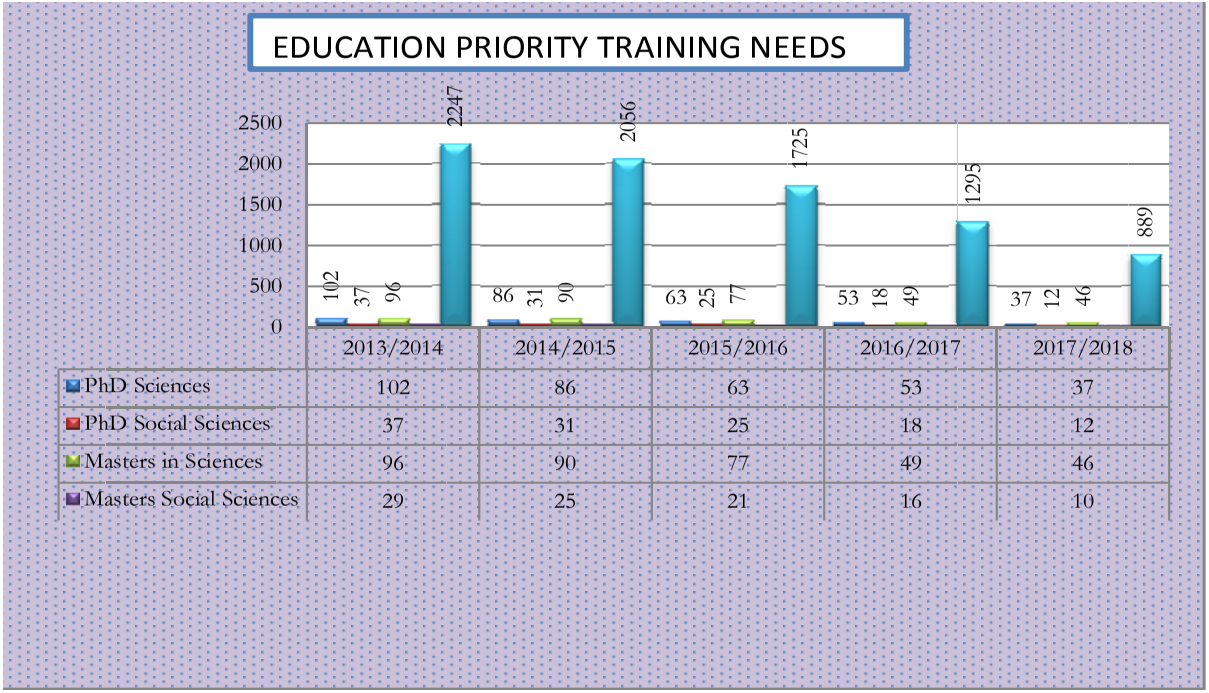
Health Sector cont'd

Area	Level	Nbr
Histopathology	MMED in histopathology	5
Medical Oncology	MMED in Oncology	6
Molecular biology	MMED in Moleculor biology	3
Nephrology	MMED in Internal Medicine with a sub speciality in Nephrology	9
Neurology	MMED in Internal medicine with a speciality in neurology	4
Nuclear Medicine	MMED in Nuclear medicine	3
Nuclear physics	MMED in Nuclear Physics	3
Ophthalmology	MMED in Ophthalmology	12
Oral and maxillofacial surgery	MMED in Oral and Maxillofacial surgery	10
Otolaryngology	MMED in ENT	17
Parasitology	MMED in Parasitology	4
Neonatology	MMED in Paediatrics with a specialty in Neonatology	10
Plastic surgery	MMED in Surgery with sub speciality in Plastic Surgery	9

Health Sector cont'd

Area	Level	Nbr
Pulmonology	MMED in Internal Medicine with a specialty in Pulmonology	9
Radiology	MMED in Radiology	10
Rheumatology	MMED in Internal medicine with a sub specialty Rheumatology	3
Toxicology	MMED in Toxicology	3
Virology	MMED in Virology	3
Biomedical Engineering	Masters in Biomedical Engineering	9
Psychiatry	MMED in Psychiatrics	5
Biomedical Engineering	A1 biomedical technicians	120
S/Total		**257**
Nurses and Allied Science	A1 Nurses	3562
Grand Total		**4,061**

3.7 Skills area and Number of Skills required in Education Sector



	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
PhD Sciences	102	86	63	53	37
PhD Social Sciences	37	31	25	18	12
Masters in Sciences	96	90	77	49	46
Masters Social Sciences	29	25	21	16	10

Major priority skills for in the Education Sector include:

A. Natural and Applied Sciences

Area	Skills Area	PhD	Masters
Agriculuture	Agricultural Economics and Agribusiness	5	3
Agriculuture	Animal Production	3	3
Agriculuture	Soil and Environment Management	5	3
Agriculuture	Plant physiology	5	3
Agriculuture	Laboratory practice	4	9
Agriculuture	Biostatistics (biometrics)	3	1
Agriculuture	Ruminant and non nutrition	5	3
Agriculuture	Livestock production systems	7	4
Agriculuture	Dairy production	3	3
Agriculuture	Meat scientist	3	2
Agriculuture	Small ruminant production	2	2
Agriculuture	Biochemistry	10	5
Agriculuture	Soil & Water Management	4	2

Area	Skills Area	PhD	Masters
Agriculuture	Environmental sanitation	2	2
Agriculuture	Agriculture Mechanisation	2	2
Agriculuture	Chemistry	10	10
Agriculuture	Forestry and Nature Conservation	2	2
Agriculuture	Crop Production & Horticulture	4	2
Agriculuture	Food Science and Technology	2	2
Agriculuture	Rural development and Agribusiness	5	5
Medicine and Public Health	Nutrion & Dietetics	2	4
Sciences	Civil Engineering/Water Science and Engineering	6	2
Sciences	Computer Science/ICT	3	9
Sciences	Electricity and Electronics	3	8
Sciences	Water engineering	3	1
Sciences	Structural engineering and Engineering Sciences	5	5
Sub total		108	97

Area	Skills Area	PhD	Masters
Sciences	Architecture	5	6
Sciences	Highway/transportation engineering	2	2
Sciences	Building and construction	2	4
Sciences	Construction management	2	6
Sciences	Surveying/geomatic engineering/GIS	2	0
Sciences	Material Sciences	7	0
Sciences	Neuroscience	7	0
Sciences	Pathology	5	0
Sciences	Physical Sciences	6	2
Sciences	Physiology, Development and Neuroscience	9	0
Sciences	Systems Biology	3	4
Sciences	Zoology	3	4
Sciences	Behavior, Ecology, Evolution and Systematics	2	3
Sciences	Bioengineering	2	3
Sciences	Biophyisics	2	3
Sciences	Chemical and Bimoelecular Engineering	2	3

Area	Skills Area	PhD	Masters
Sciences	Chemical Physics	2	3
Sciences	Engineering, Chemical	2	3
Sciences	Entomology	2	3
Sciences	Tele-communications	2	3
Sciences	Epidemiology and Biostatistics	2	3
Sciences	Behavior, Ecology, Evolution and Systematics	2	3
Sciences	Geology	4	0
Sciences	Geodesy/geodetic science	2	1
Sub total		**79**	**59**

Area	Skills Area	PhD	Masters
Sciences	Physical planning	2	2
Sciences	Civil Engineering & Environmental Technology	5	1
Sciences	Computer Engineering, Security and Applications	18	2
Sciences	Mechanical Engineering and Design	4	2
Sciences	Electronics & Automotive Engineering	7	1
Sciences	Pure and Applied Mathematics	15	15
Sciences	Biology	10	10
Sciences	Physics	15	15
Sciences	Geography	4	5
Sciences	Operation Research, Actual Sciences	3	7
Sciences	Creative Design	1	1
Sciences	Estates Management & Valuation	4	1
Sciences	Programming methodologies and paradigms	4	1

Area	Skills Area	PhD	Masters
Sciences	System development	2	4
Sciences	Data Management and Mining	2	2
Sciences	Computer architecture and maintenance	0	2
Sciences	Electronics and microprocessor design	0	2
Sciences	Operating systems	1	5
Sciences	E-commerce applications development	1	2
Sciences	Multimedia technologies	0	3
Sciences	Artificial intelligence and expert systems	3	3
Sciences	Computer and network security	0	4
Sciences	Web technologies	0	3
Sciences	Database systems and programming	0	4
Sciences	Data mining and warehousing	0	4
Sciences	Physical Education and Sports	0	5

Area	Skills Area	PhD	Masters
Sciences	Aeronautical Engineering; aviation; airport management	0	2
Sciences	Pharmaceutical Engineering	4	4
Sciences	Railway Engineering	1	6
Sciences	Highway/transportation engineering	2	1
Sub total		**108**	**119**

Area	Skills Area	PhD	Masters
Sciences	General Mechanical Engineering	0	4
Sciences	Biodiversity Conservation	2	3
Sciences	Artificial intelligence and expert systems	4	4
Veternary	Vet anatomy, histology, embryology	3	5
Veternary	Wildlife resources mgt	1	1
Veternary	Animal physiology	3	4
Veternary	Biochemistry	2	3
Veternary	Genetics	2	2
Veternary	Vet microbiology	1	3
Veternary	Vet immunology	1	3
Veternary	Vet parasitology	1	4
Veternary	Vet pharmacology/toxicology	1	2
Veternary	Animal pathology	2	6
Veternary	Public health & epidemiology	4	5

Area	Skills Area	PhD	Masters
Veternary	Environmental Health	2	5
Veternary	Theriogenology	2	2
Veternary	Sugery	3	5
Veternary	Medicine	4	3
Veternary	Animal production	1	2
Veternary	Animal improvement	1	5
Veternary	Animal nutrition	2	5
Veternary	Aquatic resources mgt	2	5
Veternary	Wildlife resources mgt	2	2
Sub total		46	83
Grand Total		341	358

B. Arts, Media and Social Sciences

Areas	Skills Areas	PhD	Masters
Arts, Social Sciences	Educational Psychology	3	5
Arts, Social Sciences	Curriculum Development	2	5
Arts, Social Sciences	Primary Teaching methodology	4	2
Arts, Social Sciences	Foundations of Education	2	3
Arts, Social Sciences	Special Needs Education	2	3
Arts, Social Sciences	Social and Educational Research	2	1
Arts, Social Sciences	E-Learning	2	5
Arts, Social Sciences	Journalism and Communication	4	0
Arts, Social Sciences	Development and Gender Studies	2	0
Arts, Social Sciences	History	3	4
Arts, Social Sciences	Philosophy	3	3
Arts, Social Sciences	Population Studies	4	3

Areas	Skills Areas	PhD	Masters
Arts, Social Sciences	Physical and Sport Education	0	4
Arts, Social Sciences	Socilogy	5	0
Arts, Social Sciences	Education and Development	3	0
Arts, Social Sciences	Ethics	2	7
Arts, Social Sciences	Drama	0	4
Arts, Social Sciences	Political Sciences, Public Administration & Conflict Management	6	0
Languages	Kiswahili	2	9
Languages	French	2	6
Languages	Kinyarwanda	2	9
Languages	English and Literature in English	2	9
Languages	Communication Skills	2	3
Law	Law	6	0
Statistics and Business	Applied Economics and Econometrics	12	3

Areas	Skills Areas	PhD	Masters
Statistics and Business	Economics and Development	5	5
Statistics and Business	Statistics, Quantitative Surveys	3	5
Statistics and Business	Agriculture, Demographics Labor Statistics	6	5
Statistics and Business	Management	4	1
Statistics and Business	Accounting	6	0
Statistics and Business	Finance	5	0
Statistics and Business	Human Resource Management	2	0
Statistics and Business	Marketing and Commerce	3	0
Statistics and Business	Business Administration	4	0
Statistics and Business	Entrepreneurship	2	0
Statistics and Business	Public Policy and International Analysis	4	0
Statistics and Business	Procurement, Logistics and Purchase	2	0
Grand Total		**123**	**104**

VET Trainers

	Areas	Nbr
TVET	Culinary Arts	24
TVET	Food and Beverage Services	100
TVET	Tour agency operation,	50
TVET	Tour guide	50
TVET	Plumbing	90
TVET	Air-conditioning and refrigeration	220
TVET	Masonry and Construction	681
TVET	Painting	90
TVET	Welding	424
TVET	Carpentry & Wood Techniques	424
TVET	Interior design	235
TVET	Interior design	240
TVET	Land Surveying	221
TVET	Land Surveying	221

	Areas	Nbr
TVET	Hardware fitting	214
TVET	Repair & Maintenance	120
TVET	Programming	90
TVET	Networking and cabling	60
TVET	Web design	60
TVET	Database management and IT security,	120
TVET	GIS applications	90
TVET	Aquaculture	153
TVET	Food conservation and processing	251
TVET	Irrigation techniques	200
TVET	Commercial cultivation	62
TVET	Electronics	300
TVET	Electrical	160
TVET	Automotive	305
TVET	Mobile phone	160

	Areas	Nbr
TVET	Biogas and Bio-mass technology	33
TVET	Geothermal	88
TVET	Ceramics	148
TVET	Banana fibers	120
TVET	Stones cutting	161
TVET	Rock Mechanics	21
TVET	Stones cutting	61
TVET	Handcraft and tailoring	40
TVET	Movie shooting,	128
TVET	Shoe Making	21
TVET	Machine Reparation	120
TVET	Ore Dressing and Metal	120
TVET	Glass and Related making	35
TVET	Metarulligy	56
TVET	Electrical Sound System	60

	Areas	Nbr
TVET	Information Technology	100
TVET	Manufacturing Pathways and Engineering	100
TVET	Hospitality	50
TVET	Tourism and Event	10
TVET	Hospitality Kitchen Operation	100
TVET	Clothing Production	50
TVET	Sport, Fitness & Recration	30
TVET	Media Imaging , Video and Sound)	10
TVET	Metals and Engineering	60
TVET	Construction	300
TVET	Beauty (Retail Makeup, Skin Care, Therapy)	50
TVET	Hair Dressing	30
TVET	Aviation (Aircraft Operations)	30
TVET	Automotive (Vehicles Building, Painiting, Panel Beating)	150
TVET	Automotive (Mechanical: Heavy Vehicles)	250

	Areas	Nbr
TVET	Automotive (Mechanical: Heavy Vehicles)	150
TVET	Automotive (Mechanical: Heavy Vehicles)	30
TVET	Film Making and Music Industry, Technical Production	50
TVET	Music Business	5
TVET	Light design & Animation	30
Total		**8212**

IV. PROPOSED OVERALL PROVIDED SECTORS' STRATEGIES

The Government of Rwanda envisages big projects to be undertaken within the next five years including the railway line, energy generation, gas methane project, booming industry/ private investment, building roads and construction, irrigation infrastructures and mining projects; and expanded ICT exploitation. Engineers and technicians are needed to facilitate the operations. This is the reason why the capacity building for these sectors will consider training different people in country and abroad using the following strategies:

- Coordinate with University of Rwanda to provide programmes related to the critical and scarce skills in priority sectors;
- Expanding the Capacities of TVET institutions (IPRCs, VTC, and ToT Centres). The TVET system is not only facing challenges of poor perception by the public but also the need to enhance quality of its training programmes in different sectors. WDA needs to work on modalities of attracting and retaining additional qualified professional and technical staff;
- Put in place an Aviation Training Center to enhance air traffic service and airport operations;
- Attract private investors in Technical and Vocational Education and Training (TVET) especially Secondary and Higher Learning Institutions.
- Identify top innovative and hardworking graduates and take them abroad for Graduate Programs and Industrial attachment in specialized careers;
- For the short to medium term (1-2 years), placement of external experts to work alongside Rwandan counterparts, building up their capacity in identified fields;

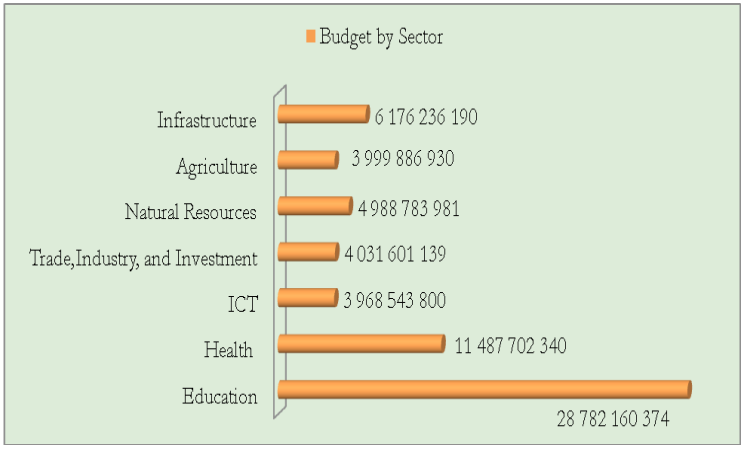
- Work placements abroad to enable Rwandan staff to receive high quality training and ensuring they are used in priority sectors on return;
- Industrial attachment and training to be included in all possible future sectors contracts to be signed;
- Aligning the current and new curriculums of universities and technical schools with required skills;
- Undertake new investments in Laboratories for TVETs Programmes and other Science-Technology Programmes;
- Training on-the-job mentoring programmes;
- Training in international trade practices , investment analysis, value commodity chain and market research;
- For purposes of having a perfect strategy of nurturing talent, innovation and knowledge transfer, there is need to launch and manage a National Science and Technology Competition Framework to promote innovations and critical thinking in priority sectors;
- Improve the quality and cost-effectiveness of in-Service Training.
- Government shall explore possibilities of establishing Regional Centers of Excellence for training in one of the region's universities, or a collaborative programme by several universities from the region. This approach shall tap into capabilities of universities that already have some of the core department related to Country priority sectors;
- There is a very limited linkage between universities and IPRCs on one hand and TVET Institutions and IRPCs offering different courses in the other hand. MINEDUC to develop modalities of promoting partnerships and linkages among these training institutions;

- Setting standards and guidelines for Researchers, Engineers, and Technicians career path progression;
- Review ICT Programmes provided by Public and Private Sectors to match with the required skills on labour market;
- Attract International Universities, Schools and Training Centers to invest in Rwanda;
- Hire qualified Professors to come in Rwanda for a given time for teaching and mentoring local medical doctors in their institutions where the infrastructure and services are available;
- Institutionalize Continuing Professional Development (CPD) to cope up with the fast changing technologies in different fields and replicate best practices;
- Review of the medical teaching curricula and develop standards for accreditation process of teaching institutions.

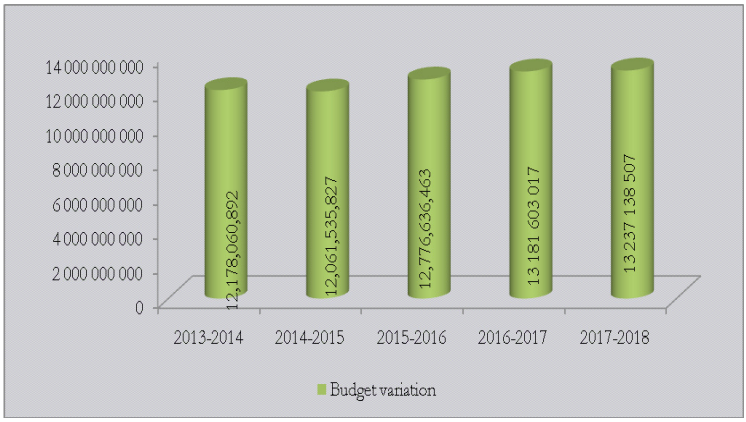
V. BUDGET IMPLICATIONS

The overall budget implications of the program is equal to 63, 434, 914,754 RwF (USD 97.5 Million).

Total budget by Sector for five years (RwF)



Annual total budget required for five years 2013-2018 (RwF)



VI. MONITORING & EVALUATION

The program implementation plan will be quarterly and annually reviewed and a mid-term as well as end term evaluation undertaken. The annual plan will be directly linked to the five year program for priority skills development to deliver EDPRS II.

The M&E framework of the program will focus on performance monitoring to keep track on whether the agreed upon plans are being effectively and correctly implemented. The framework will allow for regular and consistent tracking of performance through reviews of various inputs and outputs for each priority sector.

The five year program M&E framework will be managed by National Capacity Building Secretariat in close collaboration with concerned Sectors.

In order to ensure the Policy and Strategic direction of the program the high level National Steering Committee (NSC) was put in place and has the following membership MIFOTRA, MINEDUC, MINECOFIN, MININFRA, MINICOM, MYICT, MINISANTE, NISR, NCBS, NSTC, RDB, WDA and PSF with the following responsibilities:

- Provide strategic direction of policies, programmes, strategies and guidance on the implementation of the five year skills development program;

- Oversee implementation and unblock challenges experienced during implementation of the five year skills development program to ensure that it is implemented within a period of 5 years;
- Approving the NCBS Governing Committee's recommendations in respect to the partnerships and the memorandums of understanding to help the support of the funding and the implementation of different actions under the same program;
- With consideration of the approved five year skills development program approve the annually report prepared by NCBS and report to the Prime Minister's Office the progress status on the implementation of the same program;
- Ensure that there is synergy and coordination of key stakeholder in the implementation of this program this includes but not limited to NCBS; REB; WDA; NSTC; RMI; RDB; and PSF.

The effective implementation of this program shall be the responsibility of the identified priority sectors as further explained below:

- Take special responsibility to ensure that the priority skills to be developed each fiscal year are captured in their annual capacity building plans that are submitted to MINECOFIN with a copy to NCBS. Monitor and reporting to the Prime Minister's Office with copy to the NSC on the progress of the skills development

against each specified targets and outputs in respect to the sector;

- Assist in the mobilization of contributions from Government Budget and Development Partners;
- Help ensure that the supply of priority skills matches the demand for priority skills of the sector, and if not provide recommendations or appropriate actions for the successful implementation of the plan;
- Take responsibility for capacity initiatives that cut across the sector and bring together all stakeholders of the sector in order to ensure that their skills needs are reflected in the annual skills development program; define a robust M&E system to track progress and clearly reflects value for money.

Responsibilities of the NCBS

The responsibilities of NCBS are determined by article 4 as per the Prime Minister's Order N° 157 bis/03 of 24/05/2013 establishing National Capacity Building Secretariat and determining its mission, organisation and functioning;

The responsibilities of the Governing Committee are determined by article 6 of the same Prime Minister's Order.