Success & Challenges of the Education System and Development of National Science Strategy in Rwanda

Presentation to 5th Annual Government of Rwanda Development Partners Meeting 1st and 2nd December 2005

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Kigali, RWANDA
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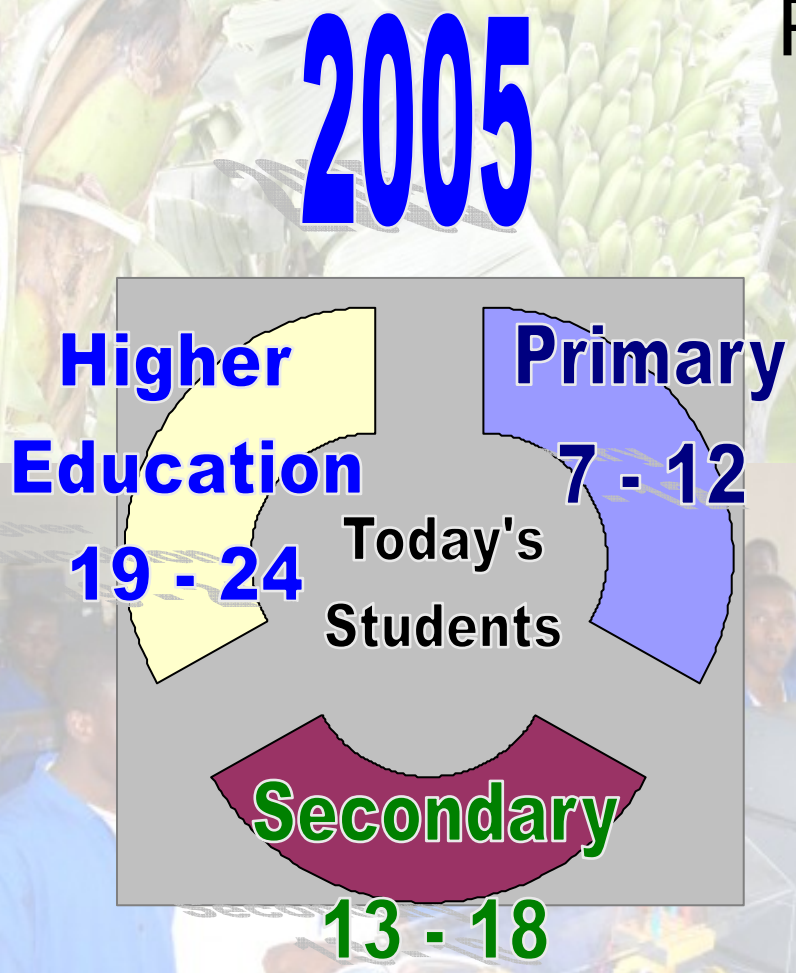
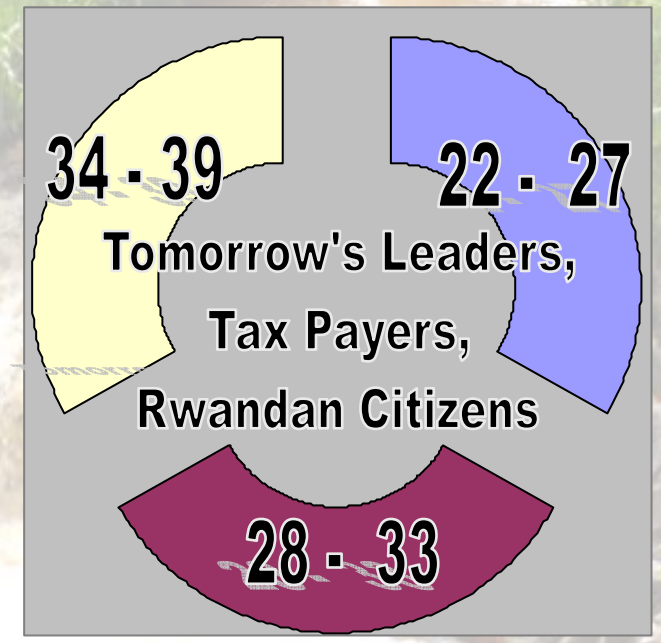
Successes and Challenges in Education

The words of Rwanda's President, His Excellency Paul Kagame

- "Rwanda's development will ultimately depend on the development of our human resource base and that of the people, with whom we share our destiny."
- "We will continue to invest in our people and we will strive to open up the frontiers of science, technology and research as we broaden our trade links with our neighbouring countries and beyond."

Today's Students are the future of Rwanda





MINEDUC – Ministry of Education, Science, Technology and Scientific Research

- **Mission and Structure**

- Ministry of Education, Science, Technology and Scientific Research (MINEDUC) is responsible for the development and promotion of Education at all levels from pre-primary to higher education including non formal and vocational training. It is also responsible for Research and the promotion of Science and Technology

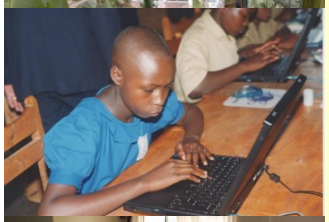
Key Considerations in Development of the Education Sector

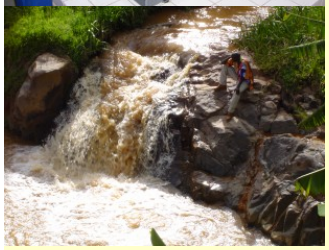
Sector Wide Approach programme (SWAP)

- Education Sector Policy (ESP)
- Education Sector Strategic Plan (ESSP)
- Joint Review of the Education Sector (JRES)
- Joint Education Sector Support (JESS)

Encompasses

- Aid Policy Management
- Poverty Reduction Strategies





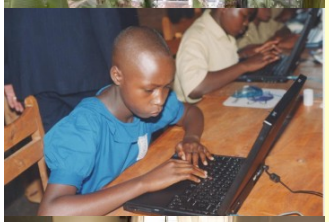
Key Considerations in Development of the Education Sector

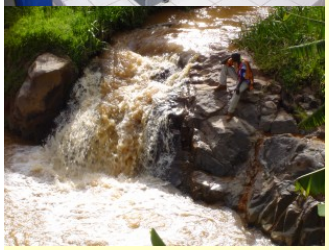
ESSP Priority Areas include:

- Education for All (EFA)
- Capitation Grant Primary Schools
- 9 Year Basic Education
- National Council for Higher Education (Public and Private)
- Science and Technology

Linked to:

- MTEF
- Annual Operational Plan
- Capacity Building





Access to Education in Rwanda

Availability:

- Inputs Required:
  - Classrooms
  - Teachers
  - Books

The following Photographs illustrate the construction of new teaching facilities in Kigali Institute of Education (KIE) and primary and secondary school construction

Construction at Kigali Institute of Education (KIE)

New Science Blocks and Student's accommodation under construction

Primary School Construction

Juru School in Umutara Province

Nyagahandagza School in Umutara Province

Musanze School in Ruhengeri Province

Bisate School in Ruhengeri Province

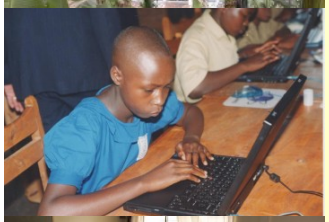
Secondary School Construction

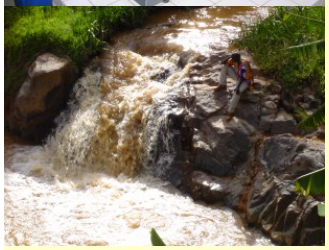
Centre Scholaire Gisozi

Kirambo Teacher's Training College

Kavumu Teacher's Training College

Nyamasheke Science School





Access to Education in Rwanda (contd)

Affordability:

- No child should be denied the chance to study due to:
  - Inability to meet cost
  - Gender discrimination
  - Any kind of vulnerability

The following tables demonstrate the progress made against the provision of facilities nationally to progress Access (availability, affordability)

Table 1: Access

a) PRIMARY EDUCATION

Years	1995/96	1999/2000	2001/02	2003/2004	2005
Schools	1,845	2,093	2,172	2,262	2,295
Classrooms		24,844	27,735	29,385	29,748
Students	1,039,657	1,431,692	1,534,510	1,752,588	1,857,841
Teachers	18,394	26,187	26,024	28,254	29,033

Table 1: Access (contd)

b) SECONDARY EDUCATION

Years	1995/96	1997/98	1999/2000	2001/02	2003/2004
Schools Pu + L.S+Pr.	228	362	363	393	504
Schools Pu + L.S.	111	176	176	185	286
Schools Private	117	187	187	208	218
Students	55,641	90,840	125,124	157,210	203 ,551
Teachers	1,800	2,399	5,557	6,329	7,750

c) HIGHER EDUCATION

Year Institutions	1995/96	1997/98	1999/2000	2001/02	2003/04
Schools (public and private)	1	6	10	10	14
Students	3,948	5,620	9,820	15,940	25,233
Lecturers	160	442	810	1,250	1,738

Table 2: Access (contd)

STUDENT ENROLMENT FOR 2004 AND PROJECTION TO 2015

	Actual	Projection		
LEVEL	**2004**	**2005**	**2010**	**2015**
PRIMARY	1,752,588	1,857,841	2,488,675	3,102,081
SECONDARY	203,551	227,949	340,948	505,824
TRONC COMMUN	131,427	151,141	239,695	338,265
DAY STUDENTS	41,132	59,305	109,692	160,079
BOARDERS	90,295	100,408	150,973	201,538
HIGHER EDUCATION	25,233	31,289	61,569	91,848

Table 2: EQUITY

a) Girls in Primary Education

	2001-2002				2003-2004			
Schools	M	F	% Females	Total	M	F	% Females	Total
Public					854,617	883,383	50,8%	1,738,000
Private					7,400	7,188	49,3%	14,588
Total Pu+Pr	763,277	771,233	50,3	1,534,510	862,017	890,571	50,8%	1,752,588
% Pu					99	99		99
% Pr					1	1		1

b) Girls in Secondary Education

	2001-2002				2003-2004			
Schools	M	F	% Female	Total	M	F	% Female	Total
Public	49,567	38,984	44,0%	88,551	66,404	47,633	41,8%	114,037
Private	29,765	38,808	56,6%	68,573	40,136	49,378	55,2%	89,514
Total Pu+Pr	79,332	77,792	49,5%	157,124	106,540	97,011	47,7%	203,551
% Pu	62,5	50,1		56,4	62,3	49,1		56,0
% Pr	37,5	49,9		43,6	37,7	50,9		44,0

Visit of Laura Bush to Fawe Girls School in Rwanda

Visit of Laura Bush to Fawe Girls School in Rwanda

Table 2: EQUITY

c) Girls in Higher Education

	2001-2002				2003-2004			
Institutions	**M**	**F**	**%Female**	**Total**	**M**	**F**	**%Female**	**Total**
Public	7,690	2,536	24,8%	10,226	10,217	4,239	29,3%	14,456
Private	2,807	2,907	50,9%	5,714	5,151	5,626	52,2%	10,777
Total Pu+Pr	10,497	5,443	34,1%	15,940	15,368	9,865	39,1%	25,233
% Pu	73	47		64	66	43		57
% Pr	27	53		36	34	57		43

Quality of Education

In parallel with the issue of Access to Education is the requirement for Quality of Education.

Two main considerations are:

Acceptability?

- Is what children are learning relevant?
- Is it providing the best solutions to individual and national problems, now and in the future?”

Adaptability?

- How flexible our education system is to different and changing demands

Challenges Include:

- Teacher Quality
- Teacher Motivation
- Quality of Teaching Methods and Learning Materials

Quality of Education

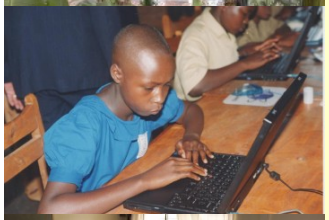
Strategies to Address the Issues and Challenges include:

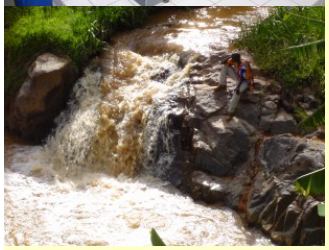
- Curriculum Review and Development
- Teacher Training
- Development of Learning Materials
- Teaching Methodologies (especially through the use of ICT)
- Inspections and Evaluation of the Education provided
- Effective Planning and Management of the System
- Teacher Development and Management Policy
- The Establishment of Teacher's Cooperatives

Other Interventions Under Development Include:

- Vocational Training Policy and Strategy
- Literacy Policy and Strategy

National Examination Council Building



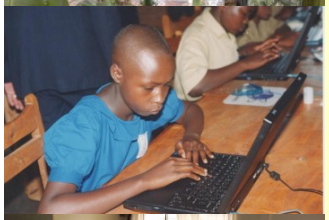


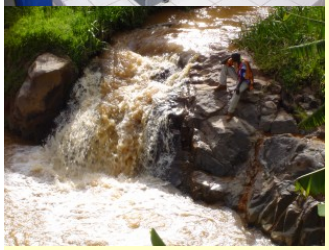
Education Office in Gisenyi Province

Development of National Science Strategy

Some of the challenges facing Rwanda today

- inability to meet food and nutrition needs for the population at large;
- over-exploitation of land;
- the need to widen our economic base
- the need to improve access to basic infrastructure and services such as housing, water, sanitation etc.
- the need to improve access to electricity and hence reduce dependence on biomass
- improve access to clean drinking water
- improve nutrition and hygiene and
- fight the prevalence of Malaria and HIV_AIDS



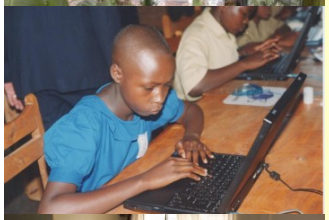


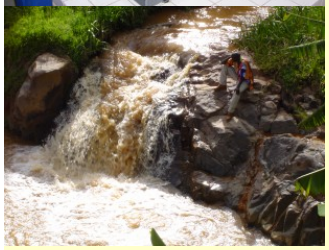
INTERNATIONAL TARGETS
The Role of Science and Technology in achieving the Millennium Development Goals

The Millennium Commission Project Task Force highlights the importance of the development of science and technology in meeting the Goals:

Goal 1	Eradicate extreme poverty and hunger
Goal 2	Achieve universal primary education
Goal 3	Promote Gender equality and empower women
Goal 4	Reduce child mortality
Goal 5	Improve maternal health
Goal 6	Combat HIV/AIDs, malaria and other diseases
Goal 7	Ensure environmental sustainability
Goal 8	Develop a global partnership for development

How a strong foundation of Science and Technology can support the development of Rwanda towards Vision 2020





The reconstruction of the nation;	An efficient State, capable of uniting and mobilizing its population;	Human Resources Development;	Town and Country Planning and Development of Basic Infrastructures;	Development of Entrepreneurship and the Private Sector;	Modernisation of Agriculture and Animal Husbandry.

Vision 2020 Pillars

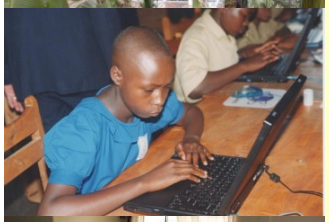
Science, Technology & Research – National Integrated Innovation & Enabling Framework

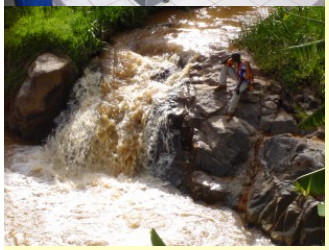
Ministry & Institution Policies, Plans and S&T Strategies

Main Implementing Institutions

Capability Building

Science and Tech-nology in Support of Vision 2020





National Science, Technology and Innovation Policy – July 2005

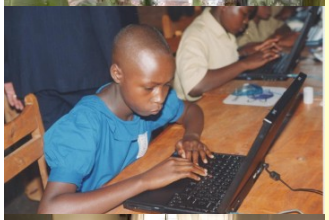
Specific Policy Objectives

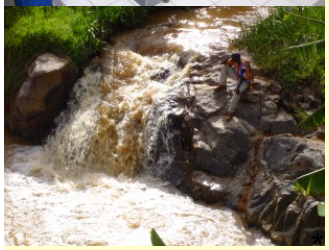
- **Knowledge Acquisition –** to reinforce Science and Technology teaching and resources at all levels of education
- **Knowledge Creation** – Develop Research Capability in all priority sectors of the economy
- **Knowledge Transfer** – To reinforce Science and Technology Capability in all priority sectors of the economy
- **Innovation Culture** – To encourage Innovation at all levels to help stimulate economic growth

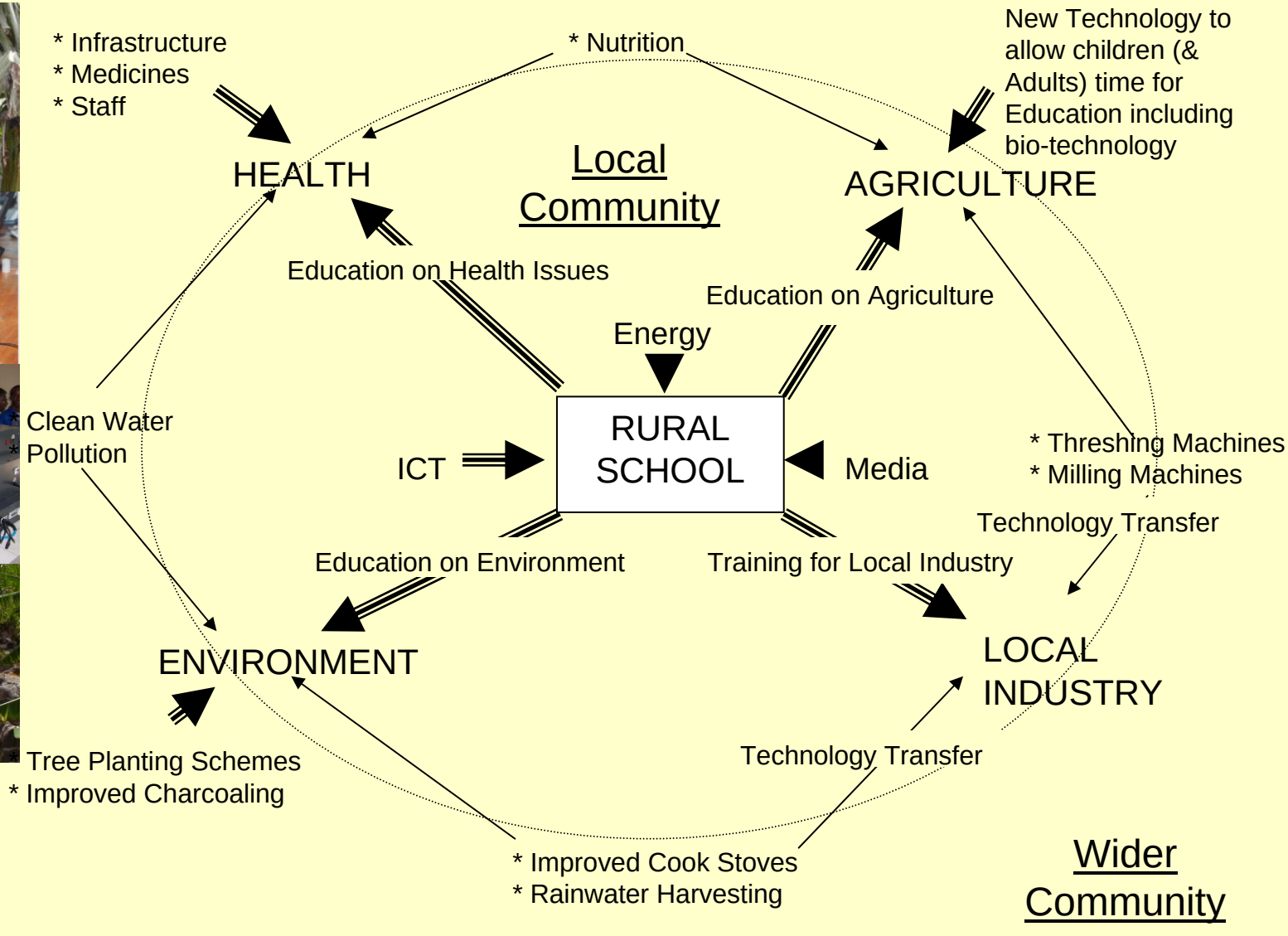
Knowledge Acquisition Overview

OBJECTIVES		INTERVENTIONS / ENHANCEMENTS NEEDED
Cultivate Interest in Science and Technology	Primary Schools	Quality of Teaching Quality of learning environment Quality of teaching Aids
Retain Interest in Science and Technology	Lower Secondary School ---------- Upper Secondary School	Laboratories & Lab. Equipment Quality of Science & Technology Teaching
Train competent artisans / technicians to give high quality support to the development needs of Rwanda	Vocational Training Institutions	Quality of Teaching & Curriculum Inst. Infrastructure Technical Equipment
Train high level technologists to give high quality support to development needs of Rwanda	Technical Training Schools	Quality of Teaching & Curriculum Inst. Infrastructure Technical Eqpt.
High level theoretical and practical training for medical practitioners, technicians in various fields, agriculturalists, veterinary practitioners etc.	Higher Technical & Professional Institutions KIST, KHI, ISAE, KIE	Quality of Teaching & Curriculum Inst. Infrastructure Technical Eqpt.
High level theoretical and practical training for scientists, engineers, doctors etc.	Higher Technological Institutions UNR, IRST, ISAR	Quality of Teaching and Curriculum Inst. Infrastructure Technical Eqpt.

Technology for Education Access to Rural Areas







Progress being made in Education in Rwanda towards Achievement of the Policy Objectives

Rwanda Development Gateway Group (RDGG)

- The Rwanda Development Gateway Group (RDGG) is an initiative of the Government of Rwanda (GOR) and the Development Gateway Foundation (DGF)
- The GOR joined the Gateway Foundation as a founding member since 2002
- The RDGG initiative is aimed at promoting the use of ICT for development

RITC overall objectives

The Regional ICT Training Centre is based at Kigali Institute of Science Technology and Management - KIST

The aim of the RITC is:

- to replace and substantially improve the ICT training capacity previously provided by semi-qualified colleges in the region
- to build an indigenous and technical human resource base

Human Capacity Development

Distance learning Project

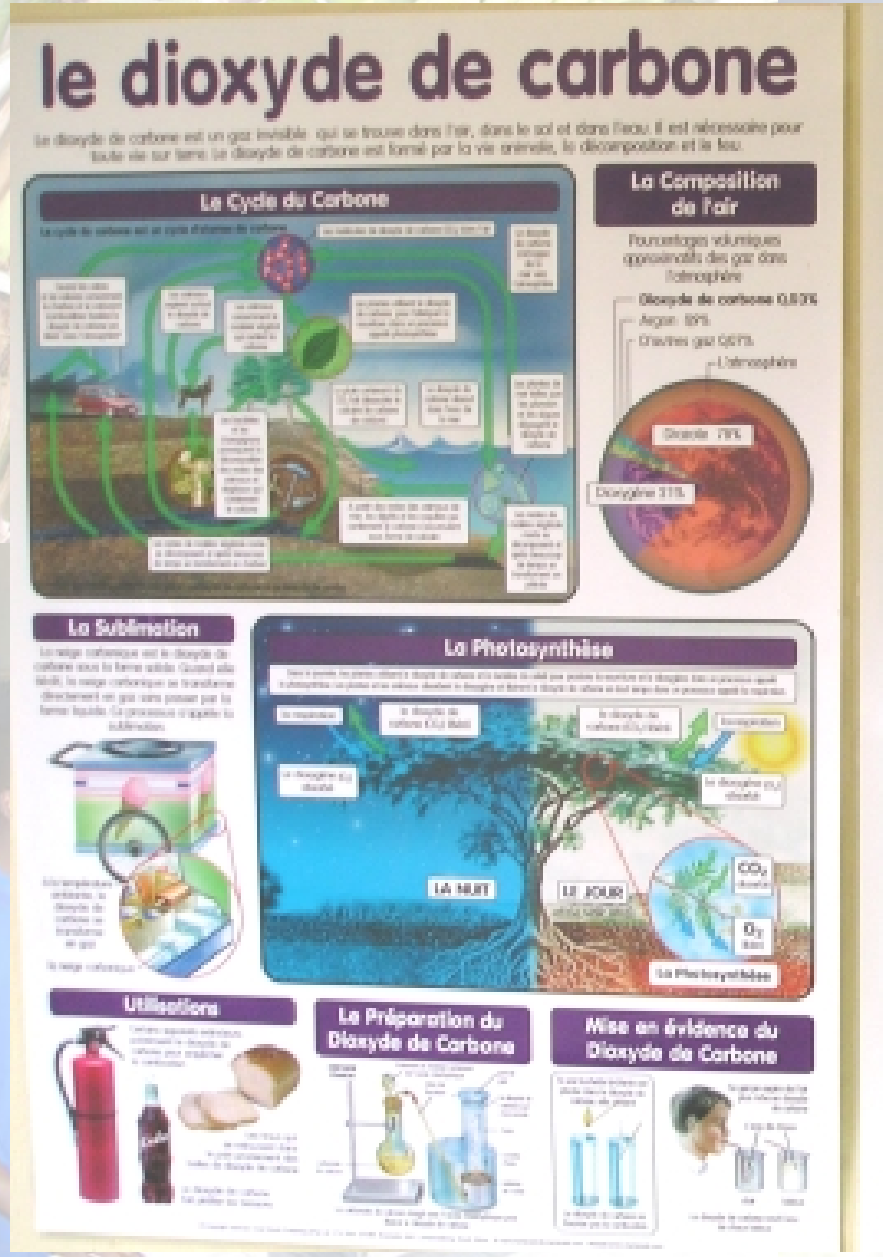
Kigali Inst. Of Education Centres established in every province

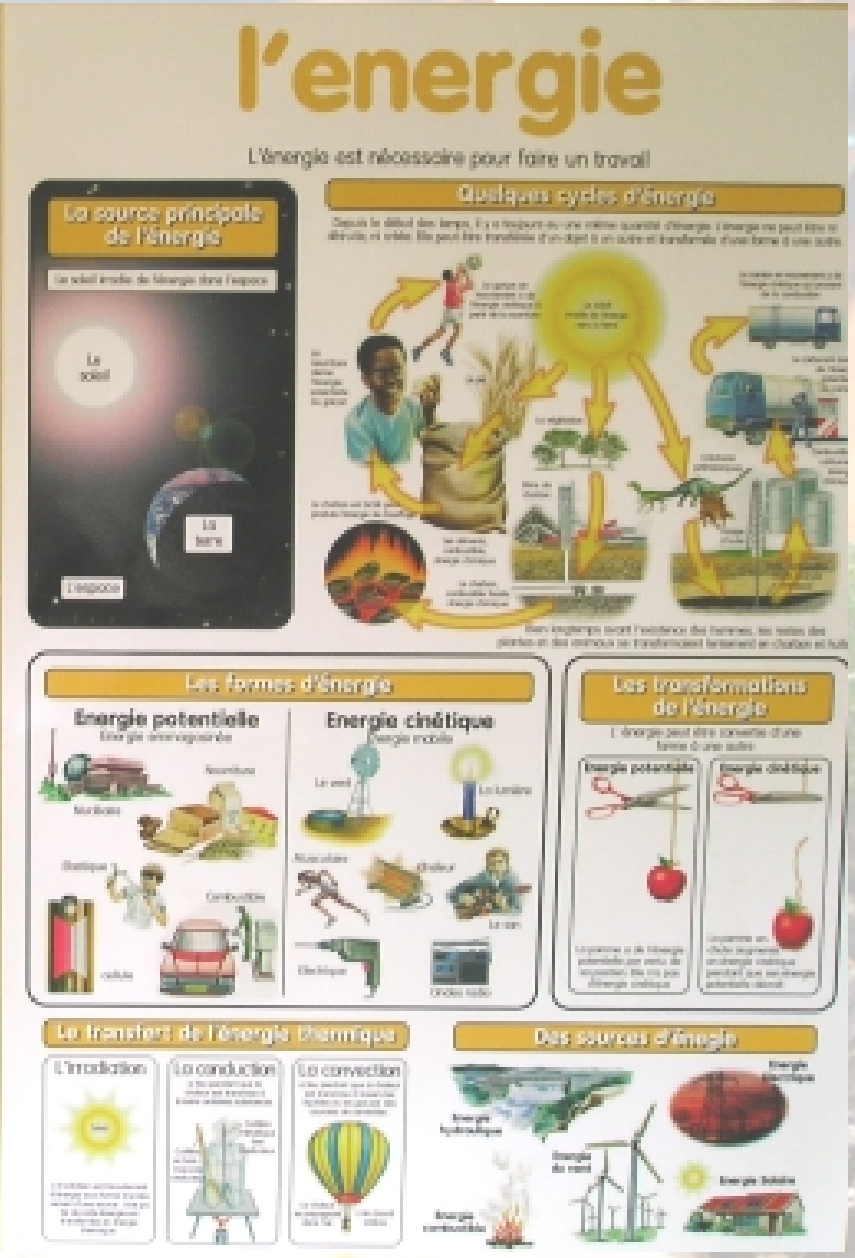
Computers in Primary Schools

Primary School students experiencing computers for the first time, including training of teachers

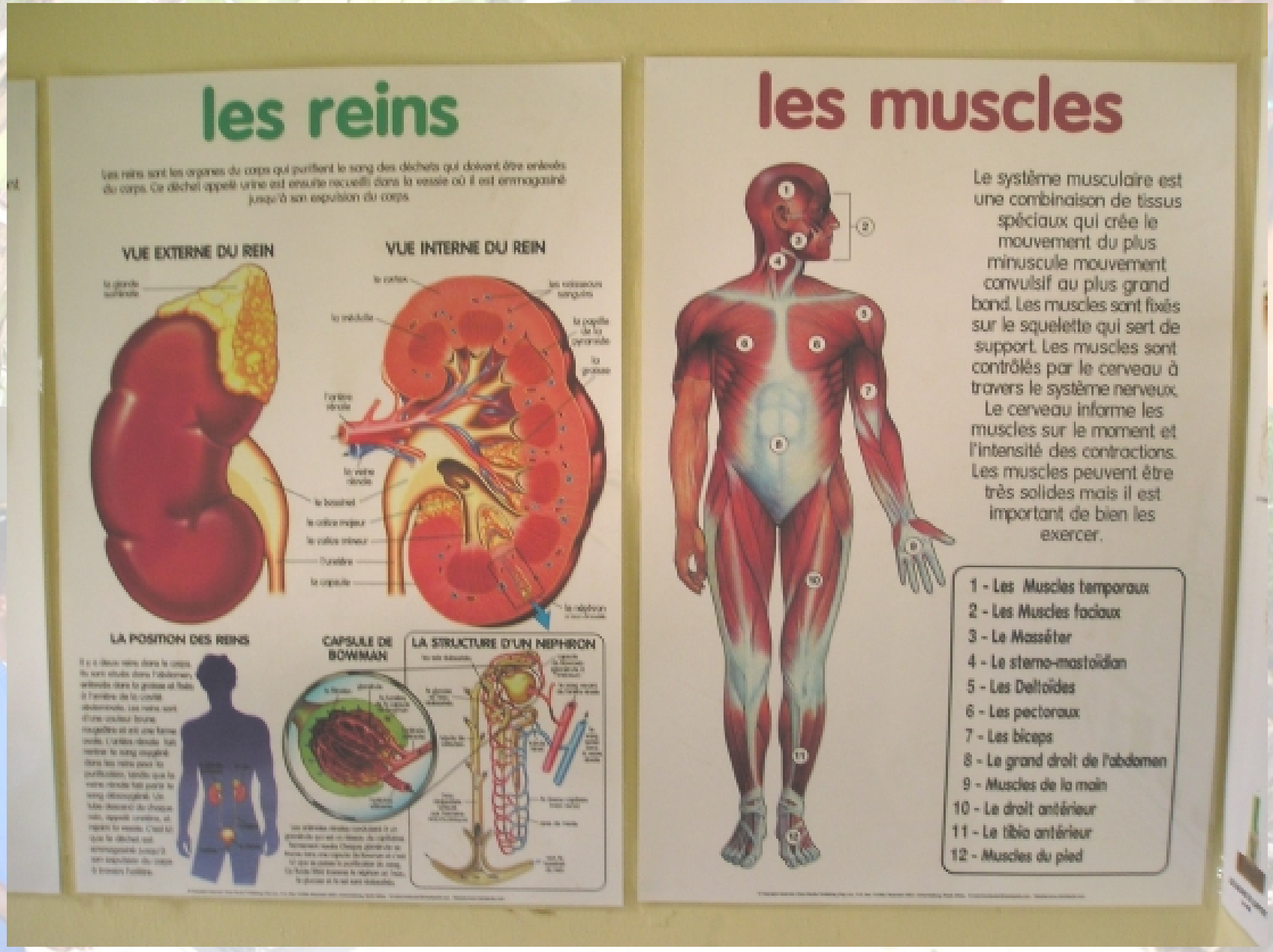
Ideas for Primary Science Corner

Ideas for Primary Science Corner





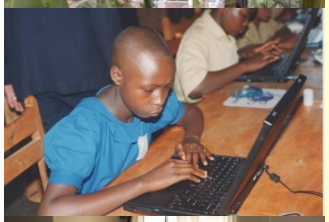
Ideas for Primary Science Corner

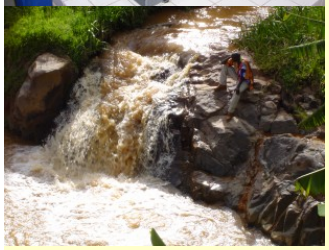


Ideas for Primary Science Corner

Ideas for Primary Science Corner

NEPAD e-Schools Program Overview





The intention of the NEPAD e-Schools Demonstration Project is to provide a continental learning mechanism, based on real world implementation experience, to inform the rollout of the broader NEPAD e-Schools Initiative.

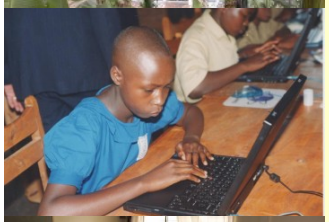
Six schools will be implemented in Rwanda, led by both Cisco Systems and Microsoft Corporation.

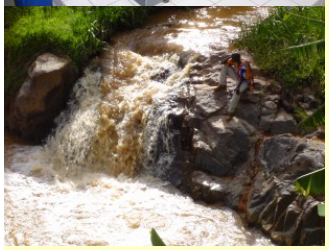
This represents a unique public-private partnership, supported by an interdepartmental National Implementation Team in Rwanda.

The primary objectives of the initiative are to provide ICT skills and knowledge to primary and secondary students; make every learner health literate; enable teachers to use ICT to enhance teaching and learning techniques; and to utilize ICT to facilitate efficient management and administration in schools.

Capacity Building for Secondary School Teachers

- RITC trained 400 teachers in 2004
- Partnership established with Microsoft Partners In Learning (PIL) to training up to 3,000 teachers by the end of 2005
- PIL 5 Day course translated into French
- Community Training Centres being established and training of trainers ongoing at present

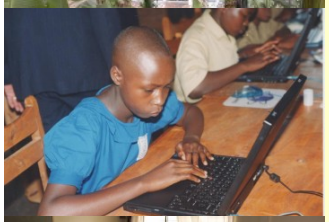


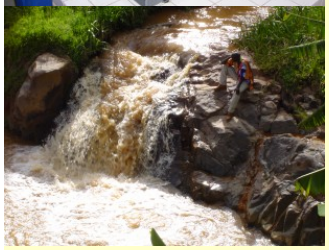


RITC Secondary School Teachers Training

Schools Infrastructure

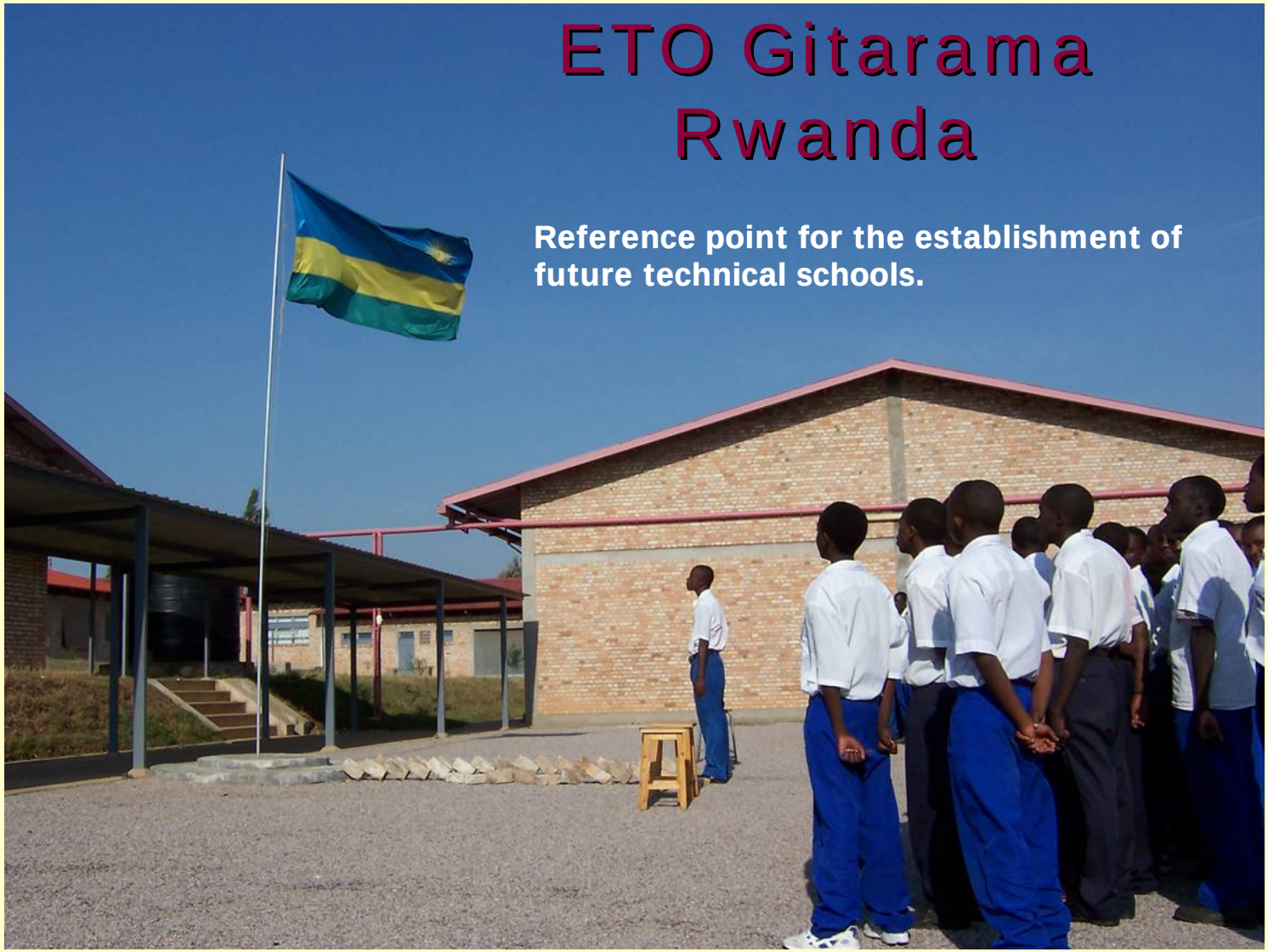
- Ministry of Education has signed an agreement for the purchase of 4,000 computers for use in schools throughout Rwanda
- Other organisations such as World Links, Computer Aid also supporting the provision of computers in schools
- Local networking being put in place to interconnect computers in the schools to set up computer laboratories



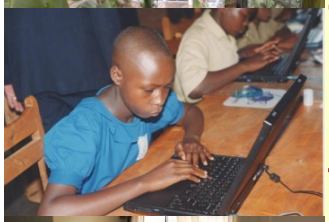


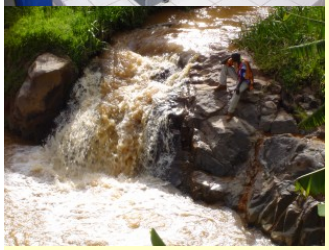
ETO Gitarama Rwanda

Reference point for the establishment of future technical schools.



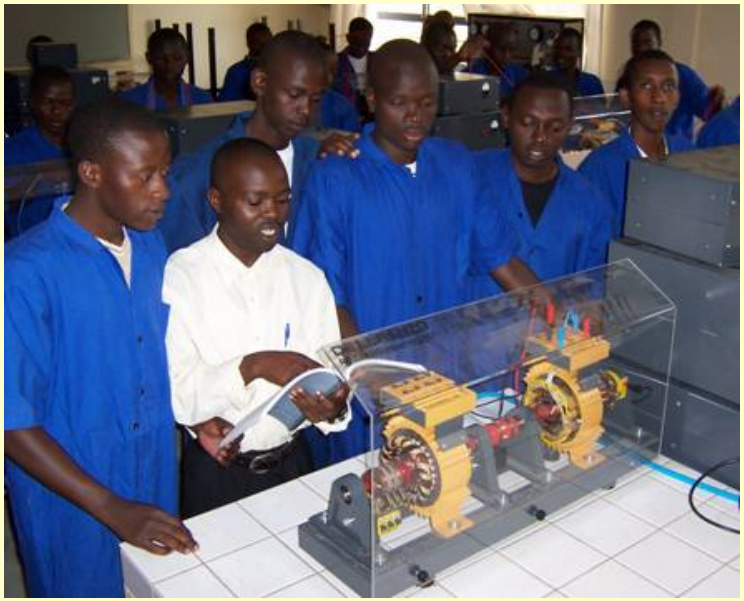
ETO Gitarama Technical Options





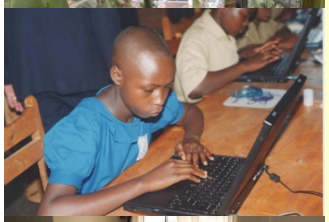
Electricity

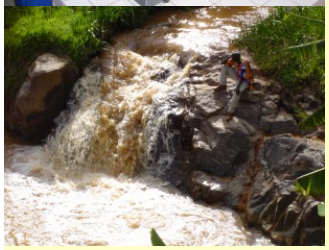
The learning of power generation & distribution from source to end-user



Electronics

The study of television, telephone & radio





ETO Gitarama
Stengthening links with industry

3D CAD Modeling "SolidWorks"

- Major link with SolidWorks of the US
- Students are using SolidWorks to design components that they then manufacture in the workshops

ETO Gitarama: Biogas Digester

- Rwanda is subject to intense deforestation, accelerated soil erosion and loss of biodiversity
- Prompted the school to change from firewood to biogas
- Biogas produced from human and animal waste through anaerobic bacterial decomposition
- The process takes place in a large underground chamber, constructed by the students
- Taking on the challenge to construct digesters for other schools & promoting the environmental friendly biogas

KIST Laboratories

Water and Waste Water Testing Laboratory

Soil Testing Laboratory

ISAE BUSOGO CAMPUS

Micro Biology Laboratory

Animal Health

Students in Library

National University of Rwanda

New Science and Technology Buildings

Electronics Workshop

Science Workshops

Sustained S&T Funding

There is a need to develop ways and means to fund Science and Technology Programmes and Scientific Research.

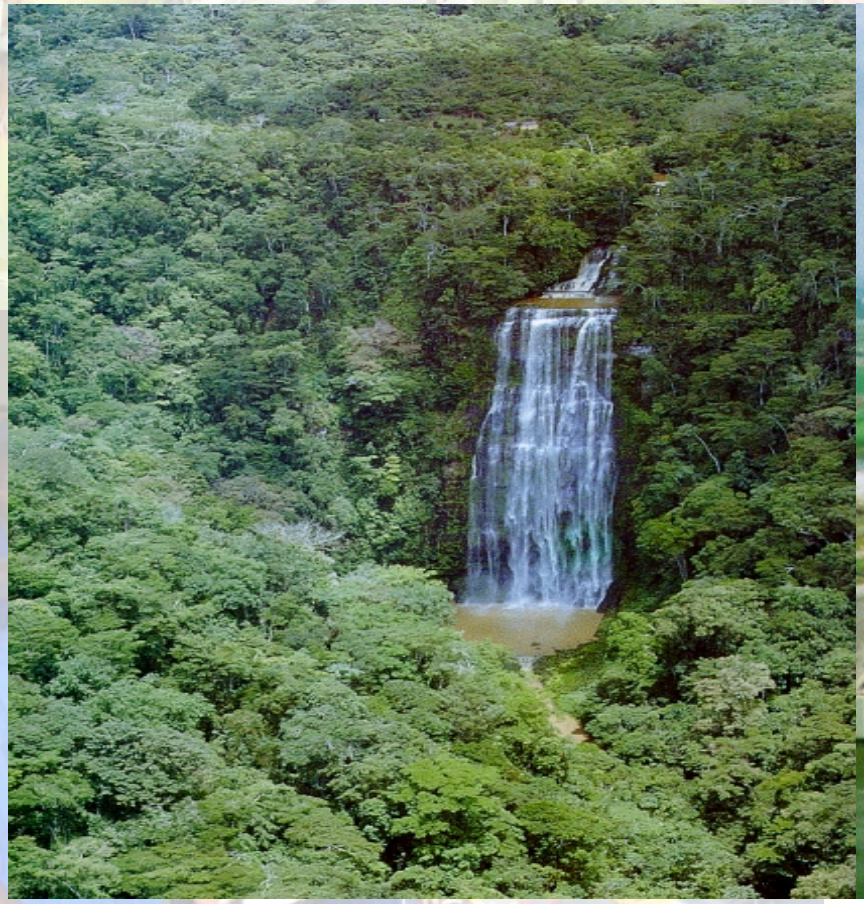
- A Research Fund will be established, under the NCSTI, and the Government shall allocate 0.5% annually of the national Budget for research and development activities.
- Resources for R&D will also be generated through participation in regional and international scientific and technological programmes (including research).
- S&T Institutions will be encouraged to generate funds by commercialising their services and outputs for the promotion and expansion of scientific and technological activities.

“Physics Teachers from UK Supporting Teaching of Practical Physics to Teachers in Rwanda”

Supported by the Institute of Physics August 2005

NUR and UNESCO-IHE

Master of Science in Water Resource and Environmental Management



A Cooperation Between Two Water Cultures

NUR and NETHERLAND NUFFIC

Masters course in Agro-Forestry and Soil Science

Farmlands Degradation due to Erosion

Contour Cultivation for erosion control

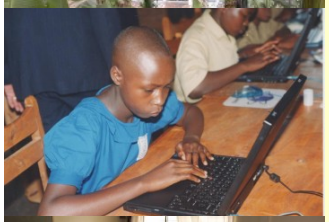
Run-off Plots for measuring Soil Loss

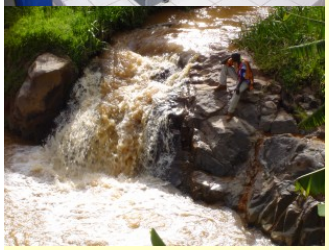
Agroforestry Practices in Radical Terracing

NUR – SIDA SAREC
Masters course in Information and Communications Technology

ICT Masters students in the ICT Lab at the National University of Rwanda

Future Challenges in Education, Science and Technology





The foregoing has outlined the strategies and successes in Education, Science and Technology

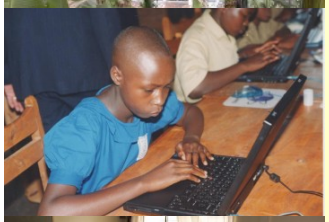
Much work has been completed and achieved over the past eleven years however……

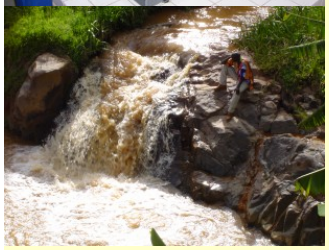
Still many challenges and hurdles to be overcome including:

- Complete outstanding policies such as Literacy and Vocational Training
- Operationalise Higher Education Council
- Operationalise 9 year Basic Education
- Close Financing Gap in Education Budget (e.g. classroom construction)
- Complete Strategic Plan for Science, Technology and Innovation
- Operationalise Science, Technology and Innovation Policy

Ministry of Education, Science, Technology and Scientific Research – Recognition Nationally and Internationally

Many Supporters to help meet challenges of the future



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THANK YOU