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PETTER ABWAD

Rapport

24th 28th - 02-1999

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**WATER QUALITY MONITORING:
A CASE OF NAIROBI RIVER**

BY

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A paper presented at the Eastern and Southern Africa Regional Networking/Training Workshop on Environmental Action Learning (EAL) Requirements. 24th – 28th August 1999. National Museums of Kenya. KOEE, UNEP, UNESCO

ABSTRACT

The distribution of water resources in Kenya varies greatly. From the standpoint of water quality, there are also many variations. There are waters with extremely low concentrations of a few ions and others which have high concentrations of various ions. Urbanisation, industrialisation and modern agriculture have affected the natural quality of water. These have rendered water bodies to become unsuitable for many beneficial uses for which they were utilised earlier. The demand for good quality water continues to rise thus making it imperative to conserve and protect the national water resources for both present and future uses. This paper looks at water quality monitoring in general and a case of Nairobi River in particular. Issues to be considered in this presentation are: -

- How to carry out a complete water quality audit step-by-step.
- How to interpret the results of the total water quality audit.
- Making recommendations on the basis of the results.
- Communicating the results and their recommendations using appropriate communication strategies and media.

KEYWORDS

Water Analysis, Parameters, Pollution, Water Quality, Standards, Guideline Values, Audit.

KEYWORDS DEFINED

1. Water Quality

The term 'quality' as applied to water embraces the combined physical, chemical and biological characteristics of water.

2. Water Quality Audit/Assessment/Analysis

This refers to a systematic or step-by-step assessment of (1) above.

3. *Pollution*

The term 'pollution' is used to denote intentional or unintentional contamination by 'foreign' substances of either water, air or land media by such quantities of substances so as to render that resource unsuitable for a specific or any other established use.

In healthy waters, the level of pollution is sufficiently low that the native microbial community contains the information necessary to neutralise the negative effects. The ability to reverse the effects of pollution or to maintain natural waters in a healthy state is dependent on the capacity to understand the ecological processes responsible for the transfer of this information. Our knowledge of these processes is meagre indeed.

NB: Any natural water body e.g. river, has the ability to purify itself but only up to a certain limit.

4. *Parameters*

A parameter refers to a quantity that does not vary in a particular case but does vary in other cases,

Or

Characteristic or feature, especially one that can be measured or quantified,

Or

A limiting factor or characteristic.

Hence, water quality parameters of interest are categorised into three namely: -

- (a) Physical parameters e.g. colour, temperature, turbidity etc;
- (b) Chemical parameters e.g. iron, sodium, calcium, lead etc;
- (c) Biological parameters e.g. bacteria, viruses etc

HOW TO DO A WATER QUALITY AUDIT

A water quality audit is an investigation to determine how healthy the water from your water source is. Nowadays, we often get our water from a water provider such as Nairobi City Council, who purify the water so that when we use the water from our taps, there are no obvious living organisms in the water. This of course makes it difficult to determine what the original water source looked like. Since a water audit cannot be carried out on tap water, go to a nearby water source such as a river, stream, dam, borehole or handpump and do an audit on that particular source. This may not be the water you are drinking, but you can still contribute towards auditing the water and then taking steps to improve the water quality if necessary.

A water quality audit (assessment) can be carried out either at home, by the family or at school with a teacher and the environmental club or all the classes in a whole grade. Divide the learners into groups and give each group the instructions on how to do an audit.

Step 1: Complete the water quality audit activities as described below using Table 1 to record your observations.

(a) Do the following: Before an audit

- (i) Record the weather conditions a week before the audit (note down the rainfall each time it rains, daily temperature and season), as they will affect animals, plants and other chemicals in the water.
- (ii) Locate your water source on a map of the chosen area. If you cannot find a map then draw your own map of the water source e.g. the river, stream or dam. When you draw the map, you must show all the activities happening around your water source, as these activities will have an influence on the water quality of your water source.

- (iii) Indigenous knowledge is a precious gift which helps us understand past experiences and how the situation developed to its current state. To find out more about the river/water source you want to audit, ask family members who have lived in the area for many years the following questions:-
- What did it look like years ago?
 - Was it a fast flowing river?
 - Was there more water than there is today?
 - Has the water changed aspects in any way (e.g. the colour of the water and the plants growing in it)?
 - Which animals lived in the water?
 - Has that changed?
 - Did the river have high banks?
 - Did people collect water from this river?

That is, it is important to understand historical change and local water quality problems.

(b) Do the following: On the day of audit

- (i) Collect water from the river source using a pair of rubber gloves to avoid infections in the event that the water is polluted or contaminated (as the case is for Nairobi river).
- (ii) Collect the water in a jar/glass/beaker.
- (iii) To catch organisms, use a net (a nylon stocking tied around a clothe hanger will be apt).

- (iv) Based on the animals we find in a water source, we can determine how healthy or unhealthy the water is, as they are a biological indicator. The secret to finding organisms or little animals in the water is to look on and under the water plants, under rocks, in the mud and in shallow pools of water. You should always keep the containers in the shade and once you have identified what animals they are, put them back into the stream or the water source in the same spot where you found them. Do this as quickly as possible, or else, they may die.
- (v) Use Table 1 to record all your observations. This Table is a very simple guide.

When recording your observations, use the Table as a guideline. Depending on which description matches the water source you are auditing, either mark the block "Healthy Environment" or "Unhealthy Environment."

(c) After the audit we must take action

The purpose of the audit is to identify the environmental problems associated with the water source you used. Now you have to take action!

TABLE 1: WATER QUALITY AUDIT SHEET

Audit activity	Healthy Environment	Unhealthy Environment
Colour of water (turbidity):	Clear depending on the environment	Murky, depending on the environment
Smell of water:	Sweet smelling	Bad odour
Stream bank vegetation: What do the plants growing next to the river look like?	Banks covered with healthy looking plants (as long as they are not <i>alien plants</i>).	Eroded and uncovered banks of covered with alien plants.
The types of water life: Consult "Hands-on stream and pond life"	Sensitive organisms in majority	Hardly and/or resistant organisms in majority
River quality observations:	No	Yes
<input type="checkbox"/> Is there litter or dead animals in the water?		
<input type="checkbox"/> Is the water muddy?	No	Yes
<input type="checkbox"/> Is there green slime, foam or froth on the water?	No	Yes
<input type="checkbox"/> Is there solid waste in the water?	No	Yes
<input type="checkbox"/> How deep into the water can you see?	To the bottom	Not very far
<input type="checkbox"/> What is on the riverbed – sand, stones or any other objects?	Sand, pebbles, boulders	Mud (silt), concrete, any other foreign materials, which should not be in a water source.
<input type="checkbox"/> What is the speed of flow of the water?	Usual movement	Stagnant or no movement
Catchment conservation: Are there any of the following close to the water source?		
<input type="checkbox"/> People?	No	Yes
<input type="checkbox"/> Farming?	No	Yes
<input type="checkbox"/> Waste water works?	No	Yes
<input type="checkbox"/> Factories?	No	Yes
<input type="checkbox"/> Mines?	No	Yes

WATER QUALITY MONITORING NETWORK

The Ministry of Water Resources in Kenya operates a National Water Quality Monitoring Network, which covers all the major rivers, lakes and aquifers. The monitoring program is important in that it enables the Ministry to generate and store useful water quality data. This data enables decisions to be made on the pollution state of the rivers, general water development planning assess impact of development activities, and on the suitability of the waters for drinking or any other use in their raw state.

Uses of water:

- Domestic uses e.g. drinking, washing, bathing etc
- Agricultural use e.g. irrigation, livestock watering etc
- Industrial uses e.g. as a coolant, as a solvent etc
- Recreational use e.g. swimming, boating, skiing etc
- Fisheries production e.g. fish farming (ponds)
- Conservation of fresh/marine water aquatic life
- Disposal of domestic, municipal and industrial wastes (receiving streams)
- Municipal uses e.g. cleaning pavements, use in commercial/business enterprises, watering flowers etc
- Transportation (navigation)

Criteria used in the establishment of Network Sampling Stations

1. Most of the stations are chosen such that they correspond with the hydrological monitoring stations, thus enabling calculation of mass loadings to be made. These enable the establishment of pollutant loads and assessment of the impact of water resources development activities to be estimated.
2. Acquisition of reference baseline data at the upper reaches of river systems, both for national and global impact assessment purposes.

3. Representativeness of the sampling site is also an important factor especially when considering lake systems.
4. Assisting in the monitoring of the efficiency of effluent treatment systems in relation to the waste assimilation capacity of the receiving water body, thereby relating system performance to the design characteristics of the treatment system, as well as keeping under observation the possible pathways of specified pollutants.
5. The immediate use or users of a particular water resource; its importance as an economic water resource to the community.
6. Accessibility and safety at the time of sampling to ensure continuity in sampling and data generation.

Sampling Frequency

The frequency of sampling at the regular water quality monitoring stations is normally four (4) times a year (January – February, April – May, June – July and October – November). Apart from these regular stations, samples are also submitted from other water bodies for routine water quality analysis and assessment of suitability for use. The following sampling schedule is adopted for water supplies: -

- Large supplies (greater than 10,000 persons) once daily.
- Medium large (5,000 – 10,000 persons) once weekly.
- Medium minor (1,000 – 5,000 persons) monthly.
- Minor water supply (50 – 100 persons) every six months.

The water quality information obtained from the Monitoring Programs is normally used in: -

- Planning and design of water supplies;
- Deciding on the suitable siting of particular industries;
- Establishment of stream and effluent discharge standards;
- Protection of fisheries and other aquatic ecosystems;
- Advising on suitability of a water source for various uses;
- General planning and water resources management;

- Stimulating water research programmes;
- Identifying those industries causing water pollution.

The Water Quality Monitoring Program is expensive to operate as it requires:-

- Field transport e.g. vehicles;
- Sampling equipment – special bottles;
- Sample storage facilities;
- Well equipped laboratories; and
- Well-trained, qualified and dedicated personnel in order to succeed.

Most developmental activities such as farming, industrialisation and urbanisation have been identified as having seriously contributed to the deterioration of water quality in this country. The following sources have been identified as major factors affecting water quality: -

- (i) Liquid and solid wastes from industries
- (ii) Fertiliser nutrients as leachates and run-off from agricultural lands
- (iii) Pesticides and pesticide residues as leachates and run-off from agricultural farms
- (iv) Domestic liquid and solid wastes from urban centres
- (v) Accidental chemical spills
- (vi) Leachates from natural causes e.g. heavily mineralised rocks.

ACTION: WATER POLLUTION CONTROL

Some of the strategies/measures, which can be adapted to control/prevent water pollution, include: -

- Soil and water conservation
- Proper agricultural practices
- Catchment protection e.g. through afforestation and reforestation
- Domestic and municipal waste water treatment
- Treatment of industrial effluents
- Proper solid waste disposal ✓

- River zoning (discourage human activities near river banks)
- Public awareness through mass media etc
- Enforcement of Environmental Legislation
- Proper location of new industries (consider effluent discharge standards and stream standards)

ANNEX 1: BACTERIOLOGICAL QUALITY

PIPED SUPPLIES	NUMBER PER 100 ml
Treated water entering the distribution system	Faecal coliforms 0 Coliforms organisms 0
Untreated water entering the distribution system	Faecal coliforms 0; 3 Coliform organisms in any one sample, 0 in any two consecutive samples, 0 in 98 per cent of yearly samples
Water in distribution system	Faecal coliforms 0;3 Coliform organisms in any one sample, 0 in any two consecutive samples, 0 in 95 per cent of yearly samples
Unpiped supplies	Faecal coliforms 0 Coliform organisms 10
Bottled drinking water	Faecal coliforms 0 Coliform organisms 10
Emergency supplies of water	Faecal coliforms 0 Coliform organisms 0

ANNEX 2: LIMITS FOR TOXIC SUBSTANCES IN DRINKING WATER

SUBSTANCE	UPPER LIMIT OF CONCENTRATION
Arsenic (as As)	0.05 mg/l
Cadmium (as Cd)	0.005 mg/l
Lead (as Pb)	0.05 mg/l
Mercury (total as Hg)	0.01 mg/l
Chromium	0.05 mg/l
Cyanides	0.01 mg/l
Phenolic substances	0.002 mg/l
Barium	1 mg/l (tentative)
Nitrates (as N)	10 mg/l
Flouride	1 mg/l

ANNEX 4: ORGANIC CONSTITUENTS OF HEALTH SIGNIFICANCE

SL NO.	SUBSTANCE	LIMIT ($\mu\text{g/l}$)
1.	Benzene	10
2.	<i>Chlorinated Alkanes and Alkenes</i>	
	Carbon tetrachloride	3
	1,2-Dichloroethylene	10
	1,1-Dichloroethylene	0.3
	Tetrachloroethylene	10
	Trichloroethylene	30
3.	<i>Chlorophenols</i>	
	Pentachlorophenol	10
	2,4,6-Trichlorophenol	10
4.	<i>Polynuclear Aromatic Hydrocarbons</i>	
	Benzo (a) pyrene	0.01
5.	<i>Trihalomethanes</i>	
	Chloroform	30
6.	<i>Pesticides</i>	
	Aldrin/Dreldrin	0.03
	Chlordane (total)	0.3
	2, 4 D	100
	DDT (total)	1
	Heptachlor and Heptachlor Eposide	0.1
	Hexachorobenze	0.01
	Lindane (γ -BHC)	3
	Methoxychlor	30

ANNEX 5: RADIOACTIVE MATERIALS

Gross alpha activity	0.1	Bq/l
Gross beta activity	0.2	1 Bq/l

**THE ROLE OF ENVIRONMENTAL INFORMATION CENTRES IN
SUPPORTING ENVIRONMENTAL ACTION LEARNING TANZANIA.**

BY: ZAFARANI MADAYI
Documentalist,
National Environment Management Council (NEMC)
DAR ES SALAAM, TANZANIA.

Paper presented at:
The Regional Networking/Training Workshop for Environmental Action Learning,
(Eastern and Southern Africa) - Nairobi, Kenya.

Date: 23rd to 29th August, 1999

1.0: Introduction.

Tanzania like other countries in Sub-Saharan Africa relies on its environmental resource base for social and economic development. This is because a high proportion of the population in the country live in rural areas, deriving their livelihood from agriculture and other natural resources utilization activities. It is therefore important that Tanzania takes the environmental friendly development approach so as address the environmental problems like land degradation, deforestation, loss of biodiversity resulting from resource over-exploitation and environmental pollution. The approach has also to consider the utilization and management of natural resources in an integrated manner so as to ensure their long-term sustainability. Managing environmental resources for the benefit and well-being of the present and future populace requires among other things, improved environmental information to guide decision making, and create an informed citizenry at all levels.

In widest sense environmental information could be any information in written, printed, graphic, or electronic form on the state of water, air, soil, flora, fauna, land and natural sites and on activities related to their uses. Put in the context of Sustainable Development it is necessary to extend the definition to include information relating to the status of the environment, including human use of environmental resources.

Information Centres and Libraries are valuable sources of information and environmental information in particular. In Tanzania there are several sectoral environmental information centres that cater for sector specific information needs. The NEMC which is an environmental agency has established its environmental information centre with the aim of collecting necessary information related to the execution of NEMC's mandate.

2.0: The Role of an Environmental Information Centre of the National Environment Management Council.

In its determination to emphasize the role of the environment in planning development, the government of Tanzania established an Environmental Information Centre (EIC) with the National Environment Management Council (NEMC). This was done with the assistance from UNDP/UNSO through project URT/90/X01. The main development objective of the EIC is to collect and provide necessary environmental information to various users to support the decision making process for Sustainable Development in Tanzania. The main objective is to elicit a clear picture of what demand exists for environmental information and how this need can be translated into a broadbased network for information sharing and networking.

Currently EIC has a library and GIS unit, it produces awareness resource materials like newsletter (Environmental News) leaflets, posters, and brochures for awareness purposes. It also produces Regional Environmental Profiles by consultation with other institutions. These profiles are available in the library for reference purposes and they also provide information used in Environmental Impact Assessment (EIA) especially in the initial environmental screening phases of proposed development projects.

- EIC has now embarked on identification of Non-Organisations (NGOs) and Community Based Organisations (CBOs) dealing with environmental issues in Tanzania. This is ongoing activity whose objectives are to compile comprehensive information on the activities from NGOs and CBOs which are involved in promoting environmental education, to establish a data bank on the activities of NGOs as regards Environmental Education, and to propose future direction for environmental education. The database has been updated and a number of 137 groups have been recorded so far.
- The GIS unit collects, and processing of spatial data. A collection of various maps related to natural resources such as forests, rivers Tanzania, land use, administrative boundaries and other issues are available.
- The reference library has about 3000 books, a collection of video and radio tapes, audio tapes, magazines, newsletters, information leaflets, posters, pamphlets, brochures, booklets teaching kits and other publications produced within and outside Tanzania. The centre is also used as a clearing house for UNEP materials and publications.
- 2.1: The Role of the NEMC's Environmental Information Centre
- EIC is one element of the government's effort in building up an environmentally aware and well-informed country in Tanzania - an essential first step in developing an improved environmental ethic within the country. Therefore, the roles of EIC include:
- To provide environmental information to various users to support decision making so as to ensure the conservation and wise use of the land water and air in co-ordination with the general public, public institutions and with appropriate regional and international institutions.
 - To ensure co-ordination and co-operation for the protection of the environment with appropriate regional and international organisations.
 - To establish an efficient and effective environmental information systems that raises awareness among the general public and to better the decision policy makers.
 - To co-ordinate Environmental Information Systems in Tanzania.
 - To maintain documentation on the various datasets, information, based on the common meta database standard and which indicate the information held by the centre, database structure, and the appropriate uses of the information.
 - To categorise all information within the centre.
 - To maintain a record of information released to users for the purpose of informing such users of new information as and when they become available.

2.2: The users of the Environmental Information Centre (EIC)

EIC is used by people of all ages from primary and secondary schools, universities, women's groups, environmental NGOs, professional organisation, researchers, government planners and decision makers.

Different institutions and individuals visit and borrow various educational materials. Also students visit our centre either in groups or individually.

2.3: Networking.

- Networking is essential in ensuring efficient flow and exchange of information and that through networking sectors can acquire information from other sector instead of generating their own, which is expensive and time consuming. The NEMC collaborates with sectoral institutions and ministries to either acquire or provide environmental information to the public. Thus, NEMC is a focal point for INFOTERRA, SADC, Environmental Education Programme and it promotes and facilitates establishment of environmental information exchange networks.

3.0: Conclusion

Information Centres plays a crucial role in informing the public and thus facilitating decision making and raising public awareness. Communication facilities like posts, faxes, electronic mails are important channels in enhancing this noble task.

NTAKIYIMANA Karojo Seth
Secteur GIKONDO
Commune KICUKIRO
P.V.K.-

Kigali, le 08/02/1999

Monsieur le Ministre de
la Fonction Publique
K I G A L I.-

Objet : Demande d'emploi

Monsieur le Ministre,

J'ai l'honneur de solliciter auprès de votre haute autorité un emploi à l'administration centrale du Ministère de l'Education Nationale.

En effet, Monsieur le Ministre, je suis détenteur d'un diplôme d'Etat des humanités pédagogiques obtenu à l'école d'Ambassade de la R.D.C (ex. Zaïre) au Burundi et une année faite à l'Institut Supérieur Pédagogique (I.S.P) de Bukavu dans l'Option de Géographie et Sciences Naturelles.

Espérant une suite favorable à ma demande, je vous prie d'agréer, Monsieur le Ministre, l'expression de ma considération distinguée.

NTAKIYIMANA Karojo Seth

CURRICULUM VITAE

I. IDENTITE

Nom : NYAKIXIMANA
 Prénom : KAROGO Seth
 Date de naissance : 1964
 Lieu de naissance : R.D.C
 Père : NYIRAKOABE Thérèse
 Mère : NYIRAKOABE Thérèse
 Nationalité : Rwandaise

II. ETUDES FAITES

De 1971 - 1977 : Ecole primaire à Lemera (R.D.C)
 De 1977 - 1980 : Cycle d'orientation à Lemera (R.D.C)
 De 1980 - 1985 : Humanités pédagogiques à l'Ecole d'Ambassade de la R.D.C
 (ex. Zaire) au Burundi.
 De 1986 - 1987 : Institut supérieur pédagogique de Bukavu (I.S.P.)
 Option géographique et Sciences Naturelles.

III. SERVICES RENDUS

De 1988 - 1994 : Enseignant au Burundi
 De 1995 - 1998 : Commerçant

Je jure sur mon honneur que les renseignements fournis
 ci-haut sont conformes à la réalité.

Fait à Kigali, le 27/01/1999

NYAKIXIMANA KAROGO Seth

MOUVEMENT POPULAIRE DE LA REVOLUTION
REPUBLIQUE DU ZAIRE

POUR COPIE CERTIFIEE
CONFORME A L'ORIGINAL
KIGALI LE 15-FEB-1989



DEPARTEMENT DE L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE

DIPLOME D'ETAT

D'ETUDES SECONDAIRES DU CYCLE LONG



NOUS, PRESIDENT ET MEMBRES DU JURY DE L'EXAMEN D'ETAT CREE PAR
L'ORDONNANCE N° 72/243 DU 17 MAI 1972

ATTENDU QUE LE NOMME .. *KAROTO NTAKIYIMANA* ..
LA NOMMEE ..

NE (E) A .. *UYIRA* .. LE .. *05-04-1964* ..
A SATISFAIT AUX CONDITIONS DE REUSSITE FIXEES PAR L'ORDONNANCE SUSMENTIONNEE
ET A OBTENU .. *CINQUANTE-QUATRE* .. % DES POINTS POUR L'ENSEMBLE DES EPREUVES

LUI DELIVRONS LE PRESENT DIPLOME D'ETAT D'ETUDES SECONDAIRES DU CYCLE
LONG, SECTION .. *PEDAGOGIQUE* .. OPTION .. *PEDAGOGIE GENERALE* ..

PERCU *200* FRs SUIVANT QUITTANCE
N° *9962/D* DU *15-FEB-1989*

FAIT A KINSHASA, LE 09 SEPTEMBRE 1985

LES MEMBRES
DU JURY.

LE TITULAIRE

LE PRESIDENT
DU JURY.

DIPLOME N° *20959*



Le Notaire
MUTABAZI Etienne

VERIFIEE
CONFORME A L'ORIGINAL
KIGALI, LE 15 FEB 1999

MOUVEMENT POPULAIRE DE LA REVOLUTION
REPUBLIQUE DU ZAIRE

DEPARTEMENT DE L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE



DIPLOME D'ETAT

D'ETUDES SECONDAIRES DU CYCLE LONG

NOUS, PRESIDENT ET MEMBRES DU JURY DE L'EXAMEN D'ETAT CREE PAR
L'ORDONNANCE N° 72/249 DU 17 MAI 1972

ATTENDU QUE LE NOMME .. *K.A.R.O.T.O... N.T.A.K.I.Y... I.M.A.N.A.*.....
LA NOMMEE

NE (E) A..... *U.V.I.R.A.*..... LE .. *05-04-1964*.....
A SATISFAIT AUX CONDITIONS DE REUSSITE FIXEES PAR L'ORDONNANCE SUSMENTIONNEE
ET A OBTENU .. *CINQUANTE-QUATRE* .. % DES POINTS POUR L'ENSEMBLE DES EPREUVES

LUI DELIVRONS LE PRESENT DIPLOME D'ETAT D'ETUDES SECONDAIRES DU CYCLE
LONG, SECTION .. *PEDAGOGIQUE*..... OPTION .. *PEDAGOGIE GENERALE*..

PERCU .. *300* .. FRS SUIVANT QUITTANCE

FAIT A KINSHASA, LE 09 SEPTEMBRE 1985

N° .. *926710* .. DU .. *15 FEB 1999*

[Signature]
LES MEMBRES
DU JURY.

LES MEMBRES
DU JURY.

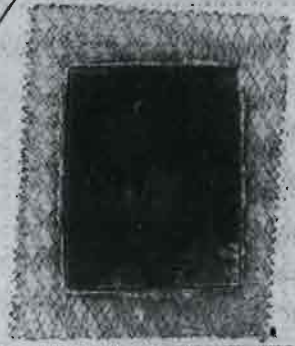
LE TITULAIRE,

LE PRESIDENT
DU JURY,

DIPLOME N° N° 20959



Le Notaire
MUTABAZI Etienne



NDUWAYEZU Faustin
C/O Maison des Jeunes
et de la Culture de
KIMISAGARA
K I G A L I

Kigali, le 22/9/1995

Monsieur le Ministre de la Jeunesse
et du Mouvement Associatif
K I G A L I

S/C de Monsieur le Directeur
de la Jeunesse
K I G A L I



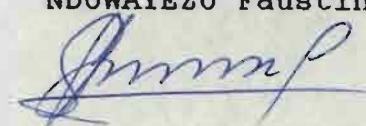
Objet:
Demande de congé
annuel, exercice
1995.

Monsieur le Ministre,

J'ai l'honneur de recourir auprès
de votre haute bienveillance pour vous demander de bien vouloir
m'accorder 30 jours calendrier de congé annuel, exercice 95, à
partir du 02 Décembre 1995 au 03 Janvier 1996.

Veillez agréer, Monsieur le
Ministre, l'expression de ma très profonde gratitude.

NDUWAYEZU Faustin.



NDUWAYEZU Faustin
C/O Maison des Jeunes
et de la Culture de
KIMISAGARA
K I G A L I

Kigali, le 22/9/1995

Monsieur le Ministre de la Jeunesse
et du Mouvement Associatif
K I G A L I

S/C de Monsieur le Directeur
de la Jeunesse
K I G A L I



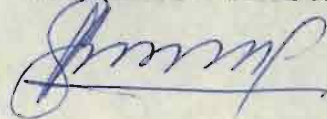
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NDUWAYEZU Faustin.



COORDINATING ENVIRONMENTAL EDUCATION: AN EXAMPLE FROM MOUNT ST MARY'S SECONDARY SCHOOL NAMAGUNGA

Stella Byaruhanga
School Environmental Education Coordinator

Introduction

Mount St Mary's Namagunga is a girls boarding school situated 38 kms from Kampala along the Kampala - Jinja highway. The school is in a rural area surrounded by sugar cane, tea and coffee plantations. Most of the local population around the school are migrant labourers who work in the plantations. The major environmental problems experienced in the area are, soil erosion, wetlands drainage, deforestation and lack of fuel wood. The school is run on a class system i.e. students work, sleep and do sports in classes. Namagunga is one of the pilot schools carrying out an environmental education programme.

Coordinating environmental education

The school environmental education committee consists of a co-ordinator, four teaching staff members, two non-teaching staff (compound manager and a compound worker) and two students who are members of the school council. The committee plans and implements the school projects. The non-teaching staff members liaise with the compound workers.

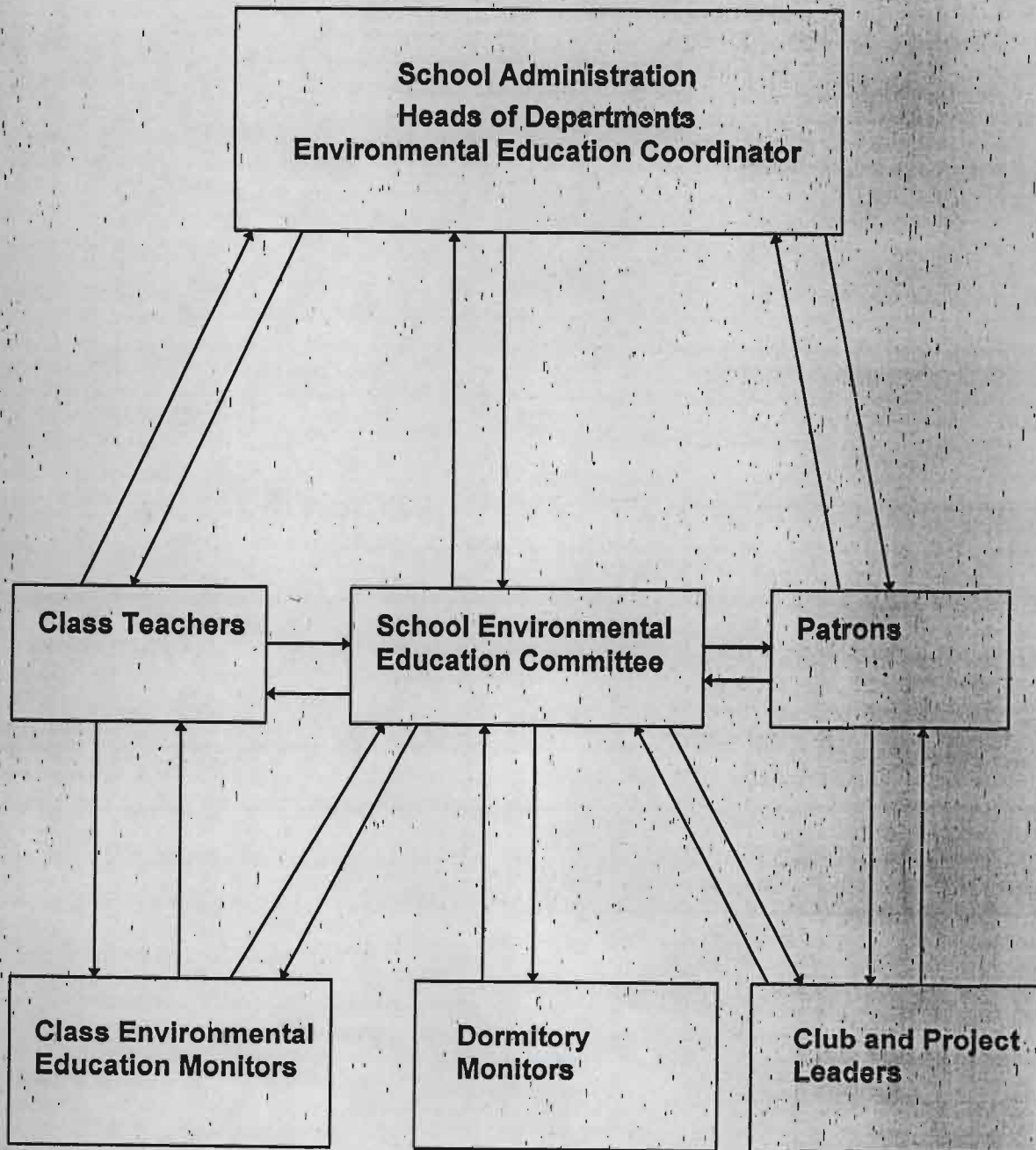
The student representatives are the ministers of self-reliance and internal affairs. Each stream has two representatives who report directly to the ministers. The students form a sub-committee consisting mainly of the dormitory monitors, club leaders and classroom environmental education monitors. The sub-committees work closely with the patrons, class teachers and environmental education committee. The Environmental education committee, the club patrons and class teachers liaises with the administration.

The Environmental Education Committee plans and advises on what to be done in the school together with the administration and Board of Governors. (The school has no PTA). For the smooth running, the school administration must be supportive. In our case, the school administration has taken action on most of the suggestions made by the committee, taken the committee members for visits to visitor centres and other schools.

See Figure 1 for the organisational structure.

Mount St Mary's Namagunga

School Environmental Education Coordination Structure



What has been done so far

After setting up the administrative structure for coordinating environmental education, the second stage was setting goals. The following are the goals that were set:

- * Sensitising and creating awareness on environmental issues among the school community;
- * Mobilising collective participation in environmental management;
- * Waste management with emphasis on waste recycling;
- * Creating money generating projects.

Activities carried out to meet the set goals

Every term, the environmental education committee develops a theme. The activities are based on the five objectives of environmental education as shown in the table below

AWARENESS	KNOWLEDGE	SKILLS	ATTITUDES	PARTICIPATION

The following are some of the activities that have carried out.

Creating awareness:

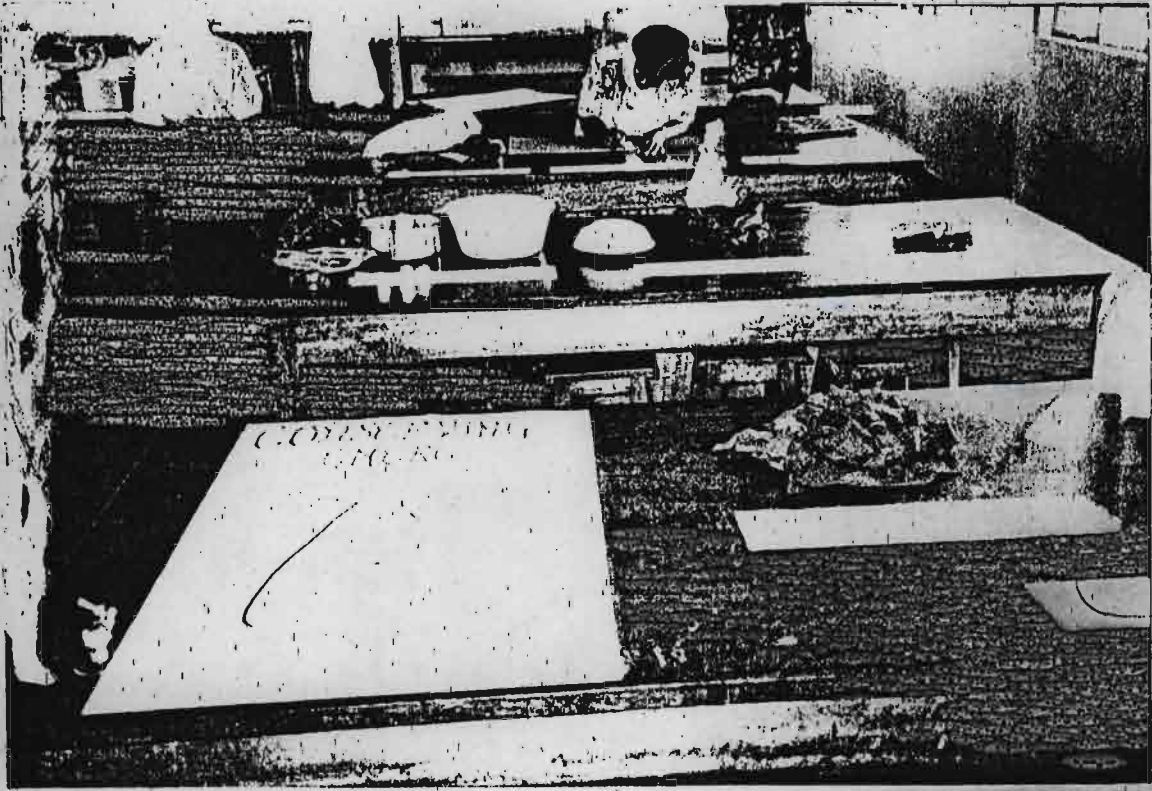
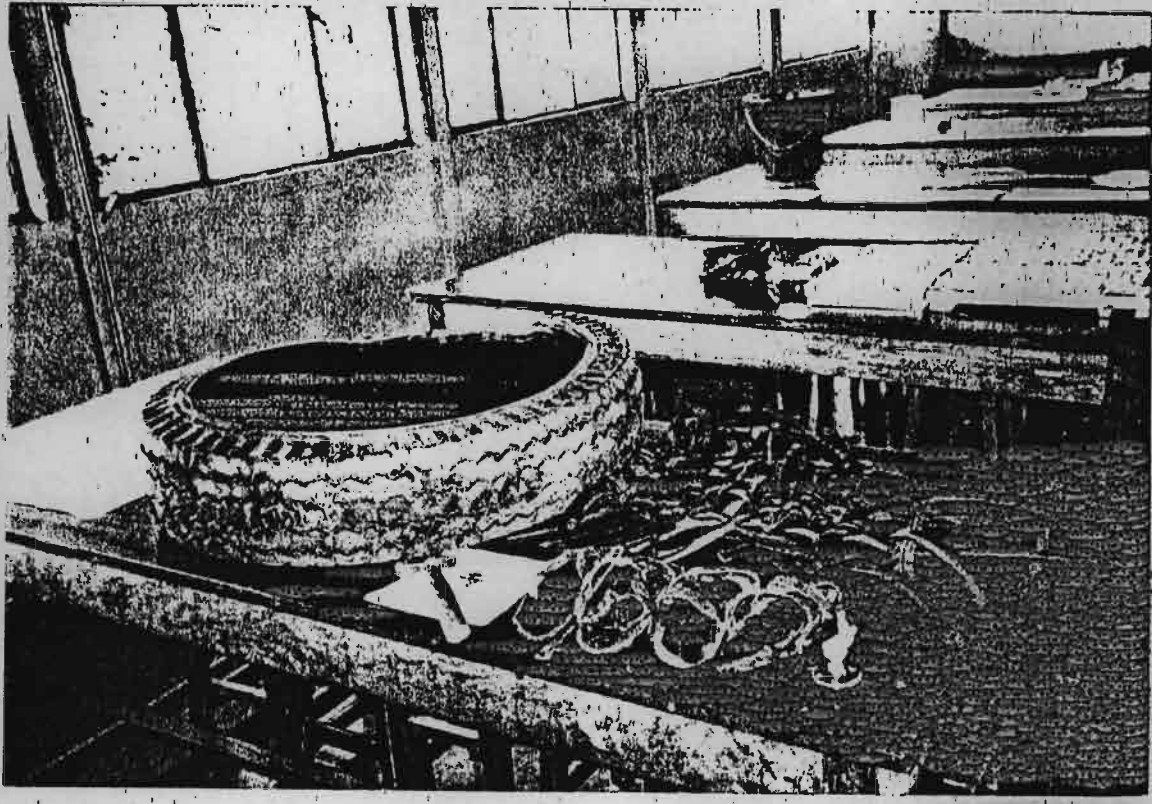
- The school carried out a survey to identify environmental problems in the school.
- The art department makes posters on the term's environmental theme.

Waste management with emphasis on recycling:

- Each dormitory area has been provided with two dustbins have tried to sort out waste into biodegradable and non-biodegradable.
- Compost pit has been put in place.
- Manure used in the school garden.
- The Art department has made a few door mats from bottle tops, table mats from drinking straws and car mats from used tires.

- Pieces of cloth from the school sewing room was used to insulate a cooking basket.
- Plastic bottles are cut and used as palates in the art room.
- Empty milk packets are used for raising seedlings and cuttings and anti-damp material. Senior threes have worked on this project.

Waste management is a continuous process, and needs everybody's cooperation. In all it is pleasing to see the students picking up polythene bags on the compound. Below are a display of articles made by students from the recycled materials.



Operation Soil Erosion

Although soil erosion is not evident in the school, when a survey was done by the students, they found that:

1) Soil had been eroded away from the verandahs. This was as a result of digging around the pavements.

2) Some of the verandah and steps were covered with soil up to 20 centimeters high.

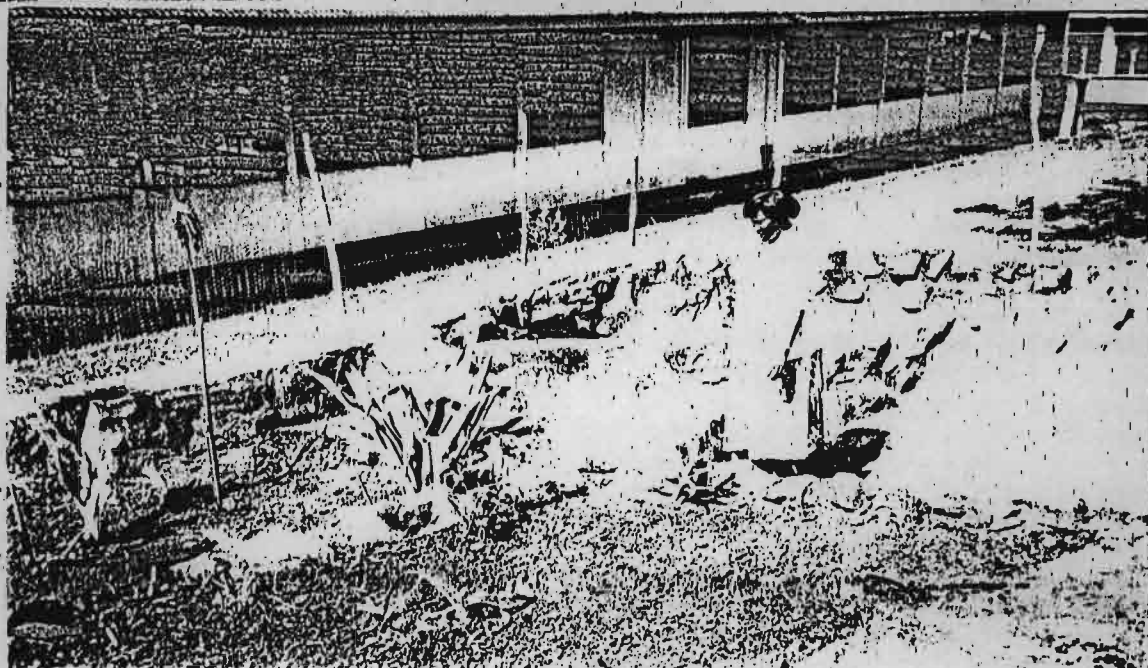
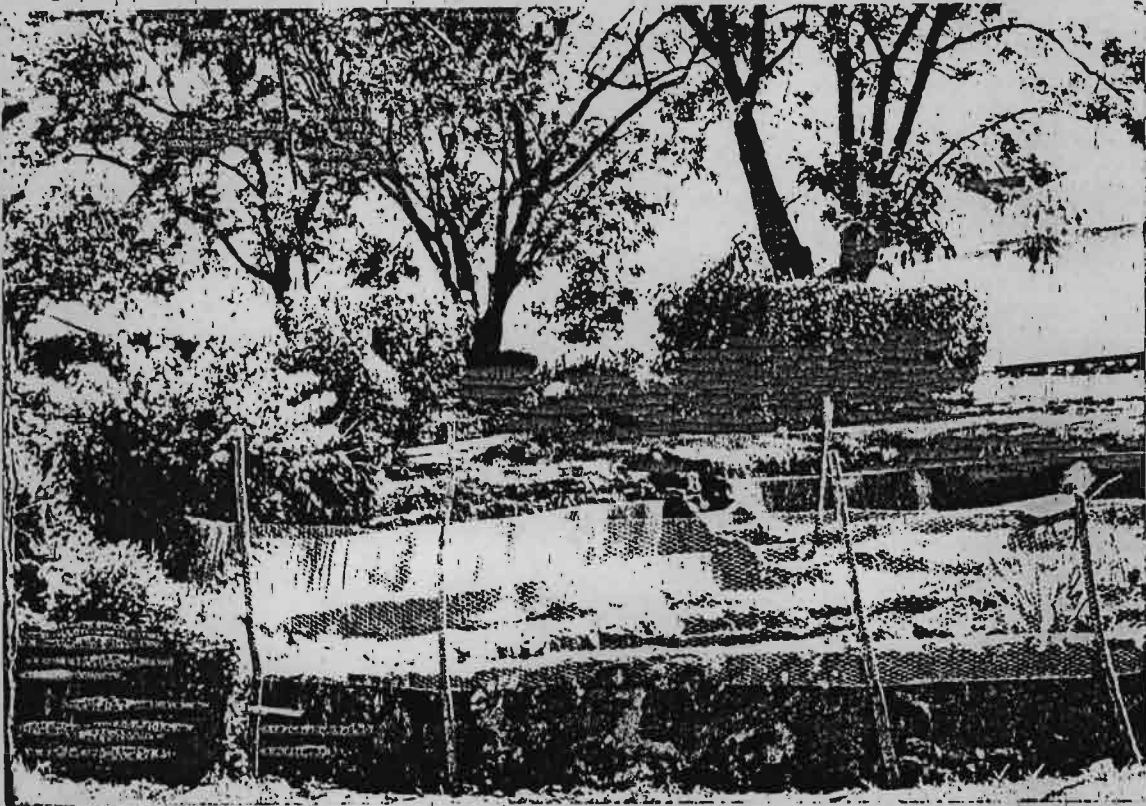
The operation soil erosion was carried out by senior twos.

Hedges

Senior ones planted hedges but what they planted dried up. The compound staff continued with the planting during the holidays and used manure. The students are watering the plants everyday.

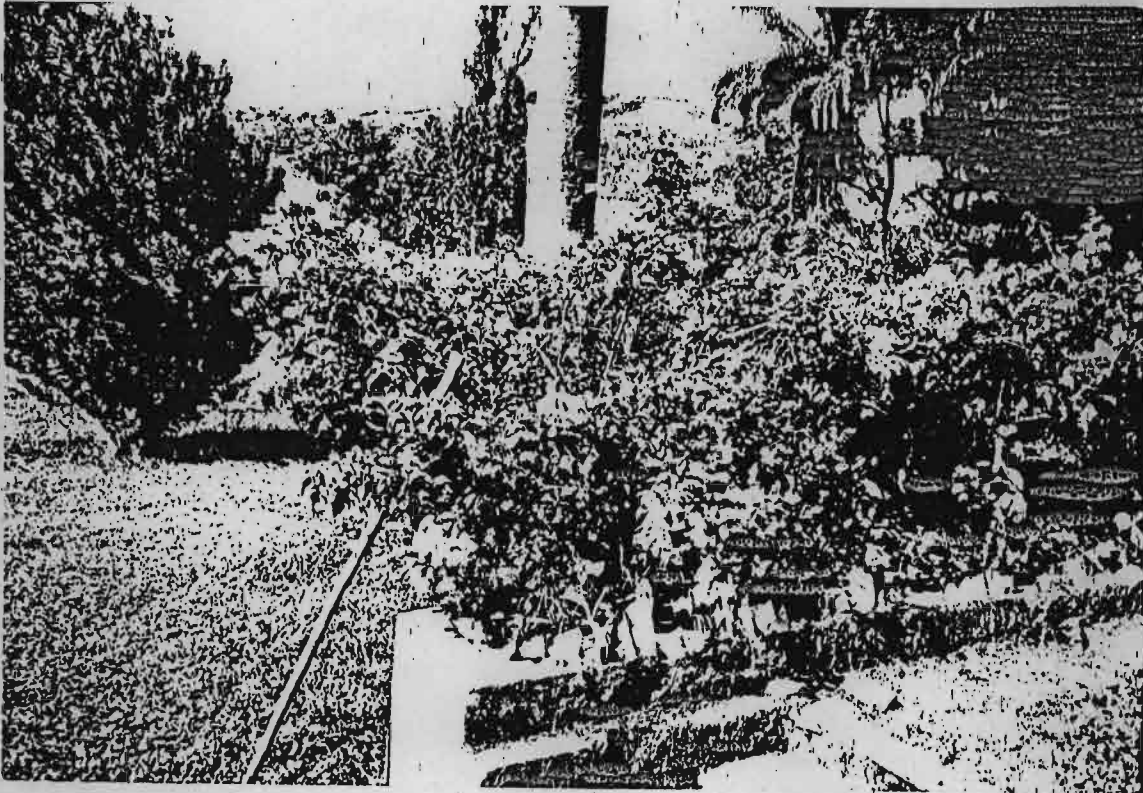
Wetland ecosystem

The school aquarium was developed into a wetland ecosystem and is maintained by the Biology department. The department also gets frogs for dissection from the ecosystem.



Income generating activities

The milk packets from the school kitchen were used to raise seedlings of potted plants shown in the photograph below. The plants were sold during the school open day and 18,000/- was realised from the sales.



Planned activities

Some projects have been planned for but not yet implemented. These include:

- ◆ Establishing a botanical garden
- ◆ Setting up a nursery
- ◆ Creating a rockery garden (a desert ecosystem)
- ◆ Building an incinerator for burning waste

Shortcomings

On the whole, awareness has been created, there are some observable changes in attitudes, a few skills has been developed and every body is participating. However, there are still a few shortcomings. Environmental education is not yet being fully integrated in all subjects. The community around the school has virtually not been reached. The Drama Club, although has come up with a few plays on the environment, a lot more could be done targeting the community. With the introduction of the Interact Club something could be done to target the community.

MUNYAMPETA Victor-Emmanuel
Professeur au Lycée des Lumières.

Kigali, le 21/11/1997.-

Monsieur le Représentant Légal
de l'A.R.R.E.

Objet : Résiliation de contrat

Monsieur le Représentant Légal,

J'ai l'honneur d'accuser réception
de votre lettre du 10/11/1997 dont l'objet est repris en marge en date du
20/11/97.

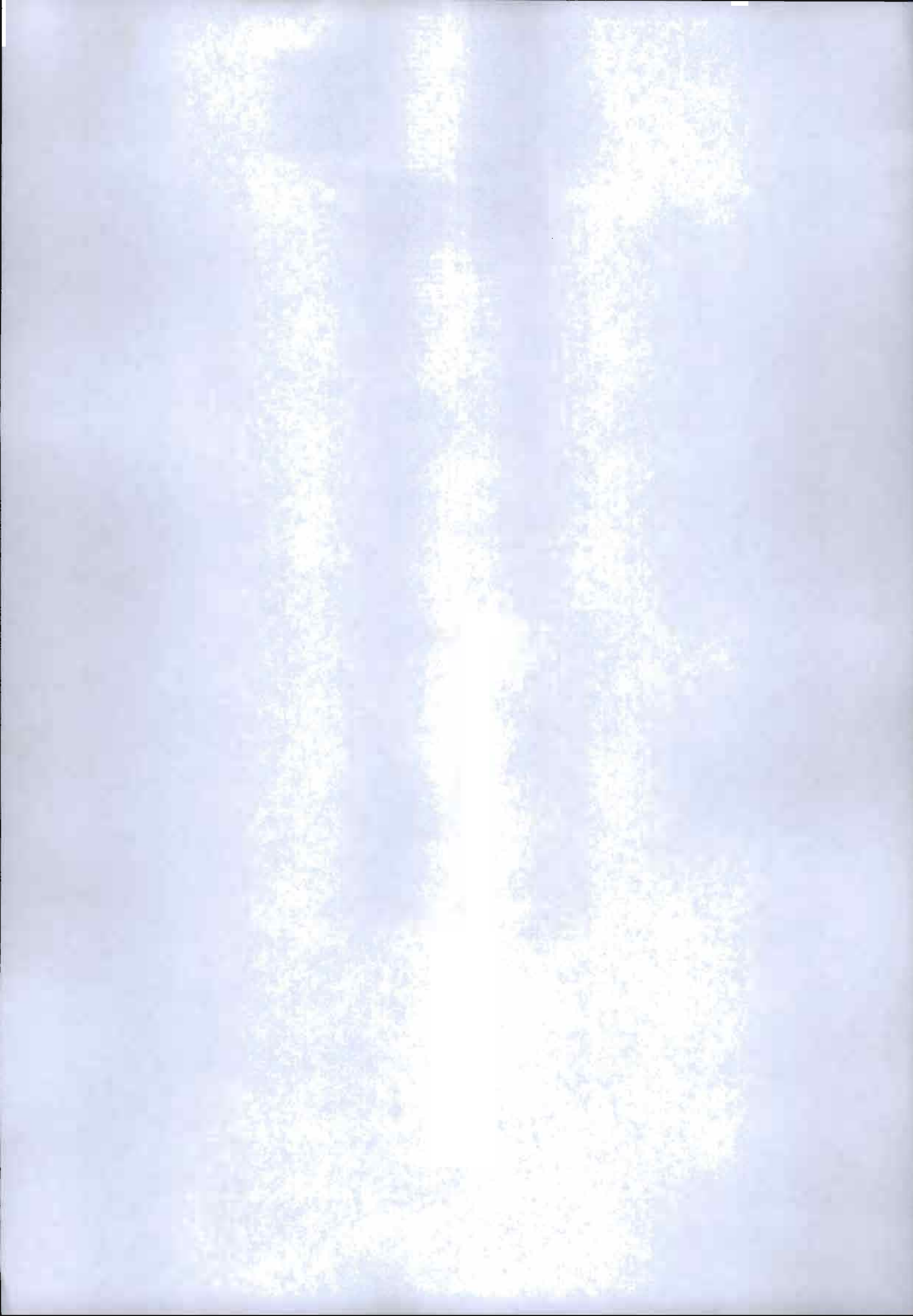
Considérant le contenu et les
modalités de ladite résiliation de contrat je me vois dans l'obligation de vous faire
remarquer que vous avez outre passé les règles et règlements relatifs aux codes
du travail en vigueur dans notre pays surtout en matière de résilier tout contrat.
Ainsi vous demanderais-je de réviser, votre lettre car je n'y vois aucun préavis
comme prévu dans la loi; sans quoi je serais obligé de recourir aux instances
habilitées.

Espérant que ma requête rencontrera
votre compréhension, je vous prie d'agréer Monsieur le Représentant Légal,
l'assurance de mon habituel respect.

MUNYAMPETA Victor-Emmanuel.



C.I : - Mr. Le Ministre de l'Education
- Mr. L'Inspecteur d'Arrondissement de Kigali-Ville



Nyiramugisha Uwizeye

Letter

2012/1995

3 Pge 1 doc

NYIRAMU GISHA
UWIZEYE

Kigali, le 21-297

W le 21/85

DAAF.

Objet: Demande d'emploi

A Monsieur le Ministre de la
Jeunesse et de mut associatif
Kigali.

Monsieur le ministre,

L'honneur m'échait de venir auprès
de votre haute autorité afin de solliciter un emploi
ausein de votre ministère.

En effet, je suis détentrice d'un diplôme
des humanités techniques option: Coupe et couture
de l'année scolaire 1987-1988.

Je profite de cette occasion pour vous signaler que j'ai une
expérience de cinq ans en qualité de directrice du foyer
social de la Somikivu (société minière d'un/kiuu) et
je vous promets de satisfaire à toutes les attributions
qui m'en seront confiées.

Esperant une suite favorable,

Je vous prie d'agréer, monsieur le ministre, mes
considérations distinguées.

Votre future employée.

NYIRAMU GISHA UWIZEYE



CURRICULUM VITAE

I. IDENTITE

- Nom: NYIRAMUGISHA
- Postnom: UWIZEYE
- Lieu et date de naissance: BUTALE, le 08/08/1965
- Prefecture de KIGALI
- Commune: NYARUGENGE
- Secteur: MUHIMA
- Cellule: KABA KENE
- Nationalité: RWANDAISE
- Etat civil: MARIEE et mere de 4 enfants.

II. ETUDES FAITES

1. Etudes primaires: 1973-1979: Ecole primaire de TANYATSI
CERTIFICAT D'ETUDES PRIMAIRES.

2. Etudes secondaires: 1981-1988: Lycée de SINGA
DIPLOME D'ETAT en COUPE & COUTURE
avec 50%

III. EXPERIENCE PROFESSIONNELLE

1989-1994: Directrice du foyer social de
la SOMIKIVU (Société minière du
Nord-Kivu)

IV D'AUTRES ATOUTS: Langues parlées: FRANÇAIS, KINYARWANDA
SWAHILI.

Je prie que ces renseignements sont
véridiques.

NYIRAMUGISHA UWIZEYE





MOUVEMENT POPULAIRE DE LA REVOLUTION

REPUBLIQUE DU ZAIRE

DEPARTEMENT DE L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE

DIPLOME D'ETAT
D'ETUDES SECONDAIRES DU CYCLE LONG



NOUS, PRESIDENT ET MEMBRES DU JURY DE L'EXAMEN D'ETAT CREE PAR

L'ORDONNANCE N° 72/243 DU 17 MAI 1972

ATTENDU QUE LE NOMME

LA NOMMEE..... NYIRAMUGISHA UWIZENZE

NE (E) A BUTALE..... LE 08-08-1965.....

A SATISFAIT AUX CONDITIONS DE REUSSITE FIXEES PAR L'ORDONNANCE SUSMENTIONNEE
ET A OBTENU CINQUANTE..... %... DES POINTS POUR L'ENSEMBLE DES EPREUVES

LUI DELIVRONS LE PRESENT DIPLOME D'ETAT D'ETUDES SECONDAIRES DU CYCLE
LONG, SECTION..... TECHNIQUE..... OPTION..... COUPE ET CULTURE.....

FAIT A KINSHASA, LE 02 JUILLET 1980

LES MEMBRES
DU JURY

DIPLOME 04495

LE TITULAIRE

LE PRESIDENT
DU JURY



N. B. Sans ratures ni surcharges. Aucun duplicata de ce diplôme ne sera délivré.

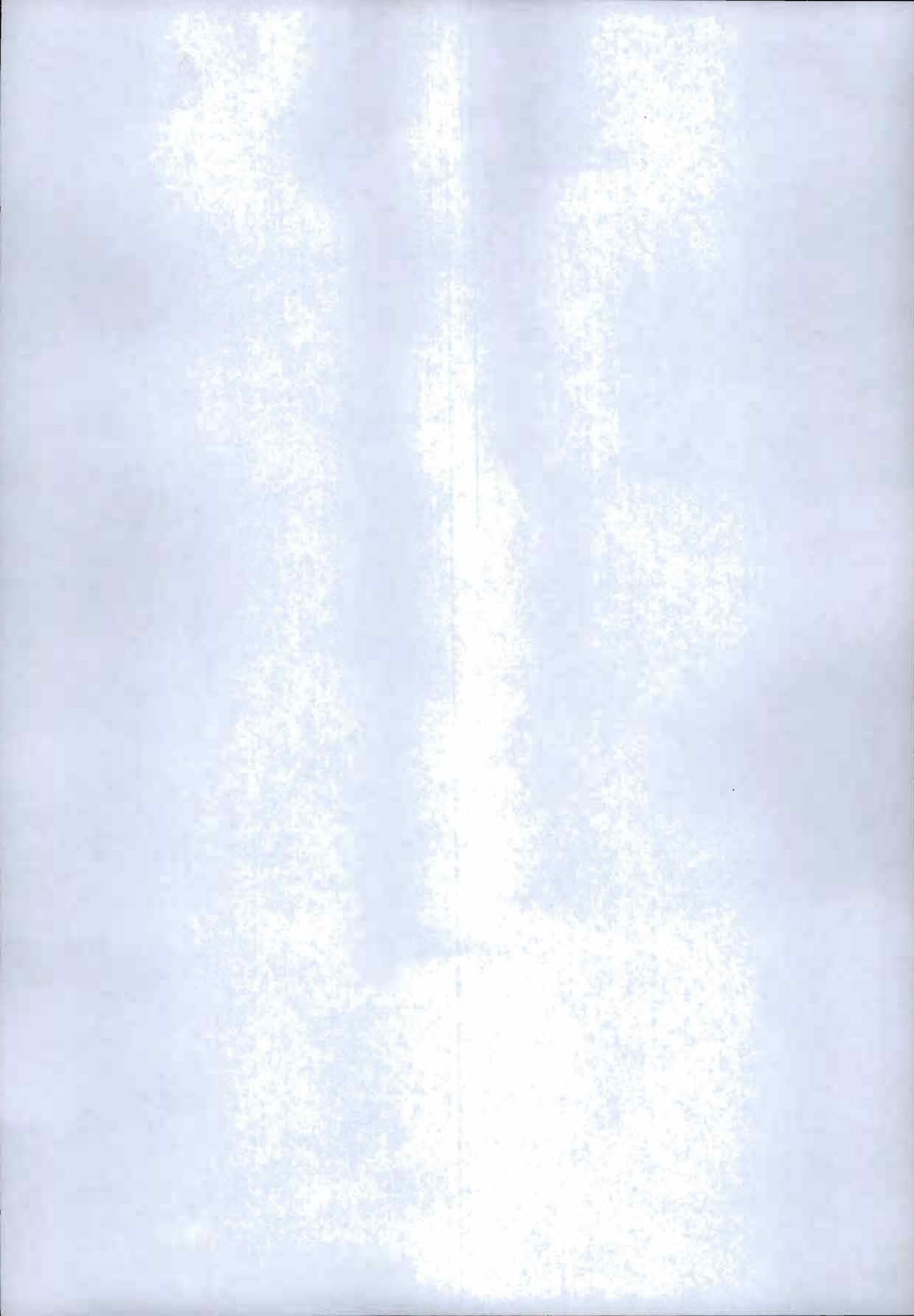
26th / 4 / 95

MR. MARK KABANDANA.

ESE mwaromutse? Tugeze hano ikuko
wari watubwiye ko ushaka kubonana natwe.
tumage iminsi turage hano ntitukubone
batubwira ko wagiye ibutare.
Turagushabaho rero ko ejo natwaga twabonana muna
saha twari twavuye 4:00AM zamugitonde
Ejo kuwukane.

Murakoze.

Richard Kayunga.



Jean Paul Muryandamutsa.

Umuyobozi w'ubuyiriko N'Amashyirahamwe

Mu muji wa Kigali

- Umushinga

U. G. 1995

10
18

JEAN PAUL MUNYANDAMUTSA
UMUYOBOZI W'URUBYIRUKO
N'AMASHYIRAHAMWE MU MUJYI
WA KIGALI.-

A traiter par	D-4
Date entrée	12/08/02/95
N° Classé	6345/91

Kigali, le 24/01/1995.-

*- Dir jeunesse
info famu
10.2.95*

(Association)

Kuri Nyakubahwa Minisitiri w'Urubyiruko
n'amashyirahamwe.

Impamvu: Umushinga
w'Urubyiruko.

Bwana Minisitiri.

Nabonye " copie " y'inyandiko mwandikiwe
na Bwana KAYUMBA Richard abasaba uruhushya rwo gutangira umushinga
ugamiye gushakira urubyiruko akazi, nkaba nashakaga kubamenyesha ko
yanshyize kuli lisiti y'abayobozi b'umushinga atabanje kumbaza.

Ntabwo rero nzajya muri Komite yawo kubera ko:

- 1: Ndanga kujya mu mishinga yose ivuka
2. RUSIMBI J. Charles arimo arahagije kuba ijisho rya Minisitari mu mu-
shinga.
3. Nkurikije uko nabonye Bwana KAYUMBA, neanga umushinga we nawushyigikira
nkawugirira akamaro ntagiye mubuyobozi bwawe.

Mugire akazi keza.

MUNYANDAMUTSA JEAN PAUL

Encadreur de la jeunesse et
des Associations en Préfecture
de la ville de Kigali.-

A/034/2

cl

MWENEDATA Manasse
DIRECTION DES SPORTS
B.P 1044 KIGALI

Kigali, le 7/6/1996

Monsieur le Ministre de la Jeunesse
et du Mouvement Associatif
KIGALI

S/C de Monsieur le Directeur des Sports



Objet :
Demande de congé annuel 1995

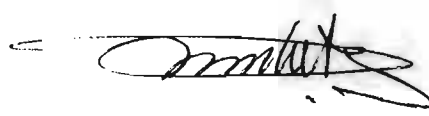
Monsieur le Ministre,

J'ai l'honneur de recourir auprès de
votre haute autorité pour solliciter mon congé annuel exercice
1995.

Au cas où ma requête serait positive,
j'aimerais le commencer en date du 8 Juillet jusq'au 6 Août 1996.

Espérant une bonne réponse, je vous prie
d'agréer, Monsieur le Ministre, l'expression de mes sentiments
distingués.

MWENEDATA Manassé



BENEGUSENGAAZIZA

B.P 244

KIGALI

KIGALI, le 29/05/1996.



OBJET: Demande d'emploi

Monsieur le Ministre de la
jeunesse et du mouvement
associatif.

KIGALI

Monsieur,

J'ai l'honneur de
m'adresser auprès de votre haute autorité, afin
de solliciter un emploi dans votre service

En effet Monsieur le
Ministre, je suis titulaire d'un diplôme des hu-
manités générales, option Math-Physique.

Veuillez agréer Monsieur
le Ministre l'expression de mon entier et respectueux
dévouement.

BENEGUSENGAAZIZA



CURRICULUM VITAE

I. IDENTITE COMPLETE

Nom : BENEUSENKA

Prénom : AZIZA

Nom du Père : RUSANGIZA.

Nom de la mère : MUNDAVA.

Date de naissance : le 26 AOUT 1975

Lieu de naissance : GITEGA

Lieu de résidence : NYAKABANDA

Nationalité : RWANDAISE.

Etat civil : CELIBATAIRE.

II ETUDE FAITES

De 1981 à 1989 : École primaire de Camp KIGALI

De 1989 à 1994 : Études secondaires au Groupe
Scolaire Saint André
option : Math - Physique.

De 1995 à 1996 : Études secondaires au Groupe
Scolaire officiel de Butare
option " Math - Physique "

III : LANGUES PARLÉES

- KINYARWANDA

- FRANÇAIS