

CHUKA



UNIVERSITY

Knowledge is Wealth (*Sapientia divitia est*) Akili ni Mali

Proceedings of the 3rd Open Research and Career Week



Theme: Developing Research Enterprises and Innovative Careers for a Prosperous Economy

Goal: Open the University to the public, show-case technology hallmarks, and select ideas for commercialization

Venue: Chuka University

Held from 2nd to 6th March, 2020



Knowledge is Wealth (*Sapientia divitia est*) Akili ni Mali

CHUKA UNIVERSITY FUNDAMENTAL STATEMENTS

Motto: Knowledge is Wealth/ Akili ni Mali (*Sapientia divitia est*)

Slogan: Inspiring Environmental Sustainability for Better Life

Philosophy: Quality education, training, research, extension, environmental sustainability and entrepreneurship lead to social cohesion, human integrity and economic development

Vision: A premier university for the provision of quality education, training and research for sustainable national and global development

Mission: To provide access, generate, preserve and share knowledge for quality, effective and ethical leadership in higher education, training, research and outreach through nurturing an intellectual culture that integrates theory with practice, innovation and entrepreneurship

Core values

1. Customer value and focus
2. Diversity and social fairness
3. Environmental consciousness
4. Fidelity to the law

5. Innovation
6. Integrity
7. Passion for excellence
8. Peaceful co-existence
9. Professionalism and confidentiality
10. Prudent utilization of resources
11. Teamwork
12. Timeliness and devotion to duty

Quality Policy Statement

Chuka University is committed to provision of quality education, training and outreach services through teaching, research, innovation, extension and entrepreneurship for sustainable national and global development. The University will provide access, generate, preserve and share knowledge for quality, effective and ethical leadership in higher education, training, research and outreach through nurturing an intellectual culture that integrates theory with practice to produce graduates with relevant knowledge, skills and responsible citizenry, and to meet customer, statutory, regulatory and other interested parties' requirements. In this commitment, the University is guided by passion for excellence, integrity, professionalism, devotion to duty, inclusiveness and peaceful co-existence. The University communicates this Quality Policy through displays, meetings and publication in key documents. The University appraises and reviews its quality policy, objectives, programmes, products, services, procedures, processes and performance from time-to-time to continually improve the effectiveness of the Quality Management System based on the ISO 9001 Standard.

DISCLAIMER

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ORGANISERS

1. Prof. Dorcas K. Isutsa - Deputy Vice-Chancellor (Academic, Research & Student Affairs)
2. Dr. Charles M. Kariuki - Director (Research, Extension & Publications)
3. Dr. Moses Mahugu Muraya – Director (Board of Postgraduate Studies)
4. Dr. Ochieng’ Ombaka - Senate Representative
5. Dr. Isaac M. Nkari - Senate Representative
6. Dr. Rael Nkatha Mwirigi - Department of Business Administration
7. Dr. Beatrice M. Mburugu - Department of Education
8. Dr. Zipporah W. Muthui - Department of Physical Sciences
9. Dr. Catherine Gichunge - Department of Nursing Sciences
10. Dr. Edwin M. Kiria - Department of Environmental Studies & Resources Management
11. Dr. Rose Nyakio Kimani - Department of Humanities
12. Ms. Joyce Mghoi Macharia – Director (Career Services)

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LIST OF JUDGES

Inter-Faculty Competition

1. Dr. Gladys Njoroge Department of Physical Sciences
2. Dr. Catherine Gichunge Department of Nursing and Public Health
3. Dr. Maina Kariuki Department of Environmental Studies and Resources Development
4. Dr. Rael Mwirigi Department of Business Administration
5. Dr. Mary Karuri Department of Humanities

Start-ups Competition

1. Dr. George Kosimbei Kenyatta University
2. Dr. David Ngigi NRF/NACOSTI
3. Dr. Moses Muraya Director, Graduate School
4. Dr. Isaac Nkari Department of Business Administration
5. Ms. Emily Murerwa Department of Computer Sciences
6. Dr. Charles Kariuki Director, RE&P

OVERVIEW OF OPEN WEEK

The theme of 3rd Open Research and Career Week was ‘developing research enterprises and innovate careers for a prosperous economy’. The principle aim of this Open Week was to encourage commercialization of research. To this end, research outputs, innovations and start-ups were evaluated based on the extent to which they incorporated entrepreneurship, their relevance to contemporary issues and their scientific soundness.

The Chuka University Open Week provided a platform for:

- a. Chuka University academic staff and students and, the private sector to share their research outputs and innovations among themselves and the general public.
- b. Provide mentorship to Chuka University students with entrepreneurial ideas and innovations
- c. Chuka University students with entrepreneurial ideas and innovations to showcase and compete for seed-capital.
- d. Mentoring and advising secondary school students on career paths and academic programmes offered in Chuka University.

PREFACE

Chuka University organized a 3rd Open Research and Career Week to be held from 2nd-6th March, 2020. The theme was: Developing Research Enterprises and Innovative Careers for a Prosperous Economy. The objectives were to publicize academic programmes and their delivery equipment, disseminate research breakthroughs for uptake by industrialists, market careers for attraction of learners and trainees, showcase professional clubs etc.

Participants were drawn from industry, higher education sector allied institutions, colleges, high schools, staff and students of Chuka University, and the general public. All Chuka University Departments, Faculties, Directorates, Campuses, Students and Collaborating Organizations participated in the Week. External participants and exhibitors included: KIPI, KENIA, KEMI, KNATCOM, NRF, NaCOSTI, KU, KWS, ESTEC, NESVAX, KUCCPS, KSG, HELB, KAM, TBC, KLB, JKF etc.

Following below are proceedings of the Open Week.

These are also available at: www.chuka.ac.ke

The next Open Week will be held after three years.

Professor Dorcas K. Isutsa, Ph.D.

Deputy Vice-Chancellor (Academic, Research & Student Affairs)

PROGRAMME
3rd Open Research and Career Week/Fair
Theme: “Developing Research Enterprises and Innovative Careers for a Prosperous Economy”
Dates: 2nd – 6th March, 2020. Venue: Main Campus, Chuka University, Kenya

Day 1: Monday 2/3/2020

Time	Activity	Venue	Time	Activity	Venue
8.00-9.00 am	Arrival and Registration	BSRC 205	8.00–9.00am	Arrival & Registration	Pavilion
Chair	Prof. Dorcas K. Isutsa	BSRC 205	Chair	Dr. Rose Kimani	
Rapporteur	Dr. Charles M. Kariuki		Rapporteur	Prof. Ochieng’ Ombaka	
9.00-10.30am	Opening Ceremony		9.00–1.00pm	Setting up of exhibits by all. E.g. External Exhibitors =	Pavilion
	Official Opening Speech by Prof. Erastus N. Njoka, Vice-Chancellor, Chuka University		1. David Mugambi Manager Legacy Star Hotel TEL: 072175152 legacystarchuka@gmail.com		13. Akili Data Doris Mugambi doris@akilidada.org Phone:0742640948
	Opening Keynote Address by John Onyango, Ag. Managing Director, KIPI; rep by David Njuguna Manager, Patents-KIPI		2. Felicity Ndege HELB TEL: 0711052283		14. KUCCPS Annah Njambi annah.njambi@kuccps.ac.ke
	Launch of Chuka University KIPI-TISC	BSRC 207	3. Rirac Driving School Tel: 0718718370 riracdriiving08@gmail.com		TEL: 020-513740
10.30-11.00am	Health Break		4. Moi Girls - Nanyuki Tel: 0722123878 moiequatorgirls@yahoo.co m		15. Stima SACCO-Embu Kenneth Chumo 0703024959
					16. Etinick Mutinda ICDL, 0724646095

Chair	Prof. Dorcas K. Isutsa	BSRC 205		5. Igoji Boys' High School No. students 48 on 5/3/2020 Tel:0713988441 6. Kaaga Girls' High School Kiranki Edward Tel: 0732236545 kirianki@gmail.com No. of students 60 Preferred date: 4/3/2020 7. Rubate secondary school Students- 49, Godfrey Njagi Tel: 0728644939 Preferred date: 3/2/2020 8. St. Augustine Boys Margret 0719339523 Date: 4/3/2020 9. Baricho Boys Francis Muli Tel:0727405797 Date: 4/3/2020 10. Albert Mugo AA Chuka. Tel: 0709333023 AAchuka@AAkenya.co.ke 11. F. Marete, Postbank, 072293168 12. KIPI, KEMI, KENIA, NRF, ESTEC, KU, NaCoSTI, UNESCO/KNATCOM, JKF		17. JKF, David Ateli dateli@jkf.co.ke Tel. 0722677473 18. James Mutinda HOD Business Development james.mutinda@ksg.ac.ke admissions.embu@ksg.ac.ke Tel:0725719129 19. Chris Njagi Transnational SACCO Tel:0721206769 Email: cris.njagi@TNsacco.co.ke Attendance date: 2 nd -6 th /3/2020 20. Eric Mwara, Britam Insurance Tel: 0723814661 emwara@britam.com Dickson Ndwiga - Embu Tel: 0722640982 dickireri@britam.com 21. Lavendar Mzulah Otieno <lavendar.otieno@pamsteele.co.uk> Pamela Steele Associates Ltd t. +254(0)205147040 Eaton Place, 2nd Fl., UN Crescent, Muthaiga, Nairobi (0)205147098 P. O. Box 63946-0061 ETC	
Rapporteur	Dr. Charles M. Kariuki						
11.00–12.00pm	Public Lecture 1 – Dr. Salome Guchu CEO / Dr. Gideon Kivengea, KENIA						
12.00–01.00pm	Public Lecture 2 – Dr. Maurice Odonde, Director KEMI & Dr. Christine K. Owinyi HoD, Research and Consultancy, KEMI						
1.00-2.00 pm	Health Break						
Chair	Dr. Rael Nkatha Mwirigi	BSRC 205		Chair	Dr. Rose N. Kimani		
Rapporteur	Dr. Isaac Micheni Nkari			Rapporteur	Prof. Ochieng' Ombaka		
2.00-2.15 pm	Micro and Small Enterprises Authority <i>Munoru Edward – Regional Enterprise Development Officer, Embu/Tharaka-Nithi</i>			2.00–5.00pm	Setting up of exhibits by Directorates, Faculties, Campuses,	Pavilion	

2.15-2.30 pm	Mathematical mind-boggling puzzles <i>Chacha et al.</i>				Departments, Clubs, External Exhibitors, Individual Staff and Students	
2.30-2.45 pm	Improving Quality Of Clinical Coding Through Training Of Health Records And Information Officers In Selected Nairobi City County Hospitals by <i>Kiongo, J. C.</i>					
2.45-3.00 pm	Colonialism and its Implications on the Agikuyu Women's Indigenous Knowledge Systems on Food Crop Production in Kiambu, 1902-1963, <i>Muraya, M. W.</i>					
3.00-3.15 pm	Microscope with Camera Slides: Show of Various Microorganisms. Muhoro, A.					
3.15-3.30 pm	Reactions					
Day 2: Tuesday 3/3/2020						
8.00-9.00 am	Arrival and Registration	BSRC 205		8.00–9.00am	Arrival & Registration	Pavilion
Chair	Dr. Isaac Nkari, Dr. Moses Muraya	BSRC 206		Chair	Ms. Florence Muthee	
Rapporteur	Ms. Emily Murerwa, Dr. Charles Kariuki			Rapporteur	Mr. Daniel Njuguna	
9.00-10.00 am	Start-up coaching and rehearsals			9.00–5.00pm	Internal and external exhibitions	Pavilion
				10.00-10.15am	Judging: FAES	Pavilion
				10.15-10.30am	Judging: FERED	Pavilion

10.00-10.30am	Health Break				
Chair	Dr. Susan Kinyua	BSRC 205	Chair	Ms. Florence Muthee	
Rapporteur	Dr. John Kamoyo		Rapporteur	Mr. Daniel Njuguna	
10.30-12.00pm	Public Lecture 3: UNESCO Opportunities Public Lecture 4: FGM Perspectives <i>By Nancy Njeri Mbugua et al., KNATCOM Kenya National Commission for UNESCO</i>		11.45-12.00 am	Judging: FBUST	Pavilion
Chair	Dr. Isaac Nkari, Dr. Moses Muraya		12.00-12.15 pm	Judging: FHSS	Pavilion
Rapporteur	Ms. Emily Murerwa, Dr. Charles Kariuki		12.15-12.30 pm	Judging: FSET	Pavilion
12.00-01.00pm	Start-up coaching & rehearsals (continued)		12.30-12.45 pm	Judging: SNPH	Pavilion
			12.45-01.00 pm	Judging: F. Law	Pavilion
1.00-2.00 pm	Health Break				
Chair	Dr. Isaac Nkari, Dr. Moses Muraya	BSRC 206	Chair	Dr. Edwin Kiria	
Rapporteur	Ms. Emily Murerwa, Dr. Charles Kariuki		Rapporteur	Ms. Hellen Ngunyi	
2.00-5.00 pm	Start-up coaching & rehearsals (continued)		2.00–5.00pm	Judging: Student Clubs	Pavilion

Day 3: Wednesday 4/3/2020

8.00-9.00 am	Arrival and Registration	BSRC 205	8.00–9.00am	Arrival & Registration	Pavilion
Chair	Dr. C. Kariuki/Dr. George Kosimbei		Chair	Ms. Joyce Mghoi	
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege		Rapporteur	Ms. Ruth M. Muturi	
<i>Start-ups Presentation and Judging Starts</i>		BSRC 205	9.00–5.00pm	Internal and external exhibitions	Pavilion
9.00-9.20 am	Suzstar Foundation/Suzstar Enterprises <i>Suzanne Chebet</i>		9.00 -10.30 am	Welcoming, career advising and touring Dr. B. Mburugu Mr. F. Gacheru	Pavilion
9.20-9.40 am	Independent Lens by <i>Felix Odhiambo</i>				
9.40–10.00am	Vegetable, Cereals and Hay Start-Up <i>Phyllis Nkirote</i>				
10.00-10.20am	UNISEK by <i>Faith Isaac</i>				
10.30-11.00am	<i>Health Break</i>				
Chair	Dr. C. Kariuki/Dr. George Kosimbei	BSRC 205	Chair	Ms. Joyce Mghoi	
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege		Rapporteur	Mr. Joshat Barasa	

11.00-11.20 am	Autumn Cosmetics <i>Robert Muli Mutua & Ruth W. Gichuru</i>			11.00 – 1.00 pm	Welcoming, career advising and touring <i>Dr. Grace Murithi</i> <i>Mr. Ken Kimathi</i>	Pavilion
11.20-11.40 am	Kilicom System by <i>Geophrey Ong'ondo</i>					
11.40-12.00 pm	Wasominet: Mary Wanjiku, Vera Kwamboka, Antony Ngereki, Saif Kinyori Simon Muiruri					
12.00-12.20 pm	Laps4hire by <i>Kelvin Gitonga</i>					
12.20-12.40 pm	Msafiri and Cozy App by <i>Cyrus Njuguna</i>					
12.40-01.00 pm	Investors Common Pool Youth Group <i>Rhoda Mutwiri Karanja</i>					
1.00-2.00 pm	<i>Health Break</i>					
Chair	Dr. C. Kariuki/Dr. George Kosimbei	Pavilion		Chair	Ms. Joyce Mghoi	
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege			Rapporteur	Ms. Ruth M. Muturi	
2.00-2.20 pm	Raising Set Books for Needy Students <i>Marion Jepkosgei</i>			2.00–5.00pm	Welcoming, career advising and touring <i>Dr. B. Kanga</i> <i>Prof. S. Wambugu</i>	Pavilion
2.20-2.40 pm	Dairy Farming <i>Kenneth Mugambi Mutuma</i>					
2.40-3.00 pm	BIZMA ENT by <i>Bethwel Kibet</i>					
3.00-3.40 pm	Expanding Business <i>David Onyango Oduor</i>					

3.40-4.00 pm	Mushroom Production by <i>Robert Waweru</i>				
4.00-4.20 pm	Landscaping by <i>John Ndung'u</i>				
4.20-4.40 pm	Soap Making <i>Wilson Njuguna Gichuha</i>				
4.40-5.00 pm	Incinerator Making <i>Isaiah Ndirangu Njiri</i>				
Day 4: Thursday 5/3/2020					
8.00-9.00 am	Arrival and Registration	BSRC 205		8.00am-9.00am	Arrival & Registration Pavilion
Chair	Dr. C. Kariuki/Dr. George Kosimbei	BSRC 205		Chair	Ms. Joyce Mghoi
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege			Rapporteur	Ms. Ruth Muthoni Muturi
9.00-9.20 am	Computer/Computer Accessories Importation <i>Pares Oketch Spondu & Felix Kiptoo</i>			9.00am-5pm	Internal and external exhibitions Pavilion
9.20-9.40 am	Mathematics Specialization and Careers <i>Faith Wairimu Kamau</i>				
9.40-10.00 am	Bread Fortified with Green Banana Flour <i>Kevin Otieno & Stephen Ochieng</i>			9.00am-5pm	Welcoming, career advising and touring Pavilion
10.00-10.20 am	Entrepreneurial Mombasa Raha Sun Cruise Hotel by <i>Victor Ochich</i>				

10.30–11.00am	Health Break				
Chair	Dr. C. Kariuki/Dr. George Kosimbei	BSRC 205	Chair	Ms. Joyce Mghoi	
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege		Rapporteur	Mr. Morris Mutwiri	
11.00-11.20 am	<ul style="list-style-type: none"> Digital Biogas Production & Supply Diagnostic: E-Health App <i>Emmanuel Muthui</i>		10.00 – 1.00 pm	Career Speakers: -Arnold Maliba of <i>OFHA</i> -HELB -KUCCPS -Akili Dada -CUAA <i>All Chuka University 4th year students should be in attendance</i>	Pavilion
11.20-11.40 am	Post-Harvest Vegetable Loss Reduction <i>Dominic Kipng'eno</i>				
11.40-12.00 pm	Digital Marketing & Graphics Designing <i>James Njenga</i>				
12.00-12.20 pm	Africanism Jewelries by <i>Ruth Wanjiru</i>				
12.20-12.40 pm	Banana & Orange Peels Organic Manure <i>David Githingi</i>				
12.40-01.00 pm	Natural Gooseberry Juice <i>Abigael M. Ndanu & David K. Kamau</i>				
1.00-2.00 pm	Health Break				
Chair	Dr. C. Kariuki/Dr. George Kosimbei	BSRC 205	Chair	Dr. Henry Nabea	
Rapporteur	Dr. M. Muraya/Dr. David Ngigi/P. Chege		Rapporteur	Ms. Miriam Njagi	

2.00-2.20 pm	Network Marketing by <i>Andrew Ouko, Franklin Mokuu, James Mwaniki</i>			2.00pm-4.00pm	Entertainment by Talented CU Students <ul style="list-style-type: none"> • University choir • Catholic choir • Kalenjin cultural grp • Kikuyu cultural grp • Maasai cultural grp • Salsa • Karate • Newbliden • CHAKICHU (Kiswahili club) 	Pavilion
2.20-2.40 pm	Small Business Branding & Marketing <i>Timothy Omwaka Sakwa</i>					
2.40-3.00 pm	Increasing Vegetable Shelf-life & Environmental Conservation <i>Florence N. Katumo, Katua Katuli, Dominic Kipng'eno</i>					
<i>Start-ups Presentation and Judging Ends</i>						
Chair	Dr. C. Kariuki/Ms. J. Mghoi & Judges					
Rapporteurs	-Ms. Marion Mutwiri -Morris Mutwiri					
3.00-5.00 pm	Preparation of Certificates & Awards					
Day 5: Friday 6/3/2020						
8.00-9.00 am	Arrival and Registration	ALL		8.00am-9.00am	Arrival & Registration	Pavilion/ BSRC
9.00–10.00 am	<i>Early Health Break</i>	<i>BSRC 205</i>		9.00–10.00 am	<i>Early Health Break</i>	<i>BSRC 205</i>
Chair	Prof. Dorcas K. Isutsa, DVC (ARSA)	Pavilion		Chair	Dr. Edwin Kiria	
Rapporteur	Dr. Charles Kariuki, Director (RE&P)			Rapporteur	Dr. Isaac Nkari	

Activity	Closing and Awards Ceremony		9.00am-1.00pm	Welcoming, career advising and touring Mr. A. Muguna Dr. Jane Mugai	Pavilion
10.00-10.30am	All Guests Seated Opening Prayer: Dr. Grace G. Murithi		9.00am-1.00pm	Internal and external exhibitions	Pavilion
10.30-11.30am	Closing Keynote Address by Dr. Jemimah Onsare, CEO NRF - Nairobi				
11.30-11.40am	Official Closing Speech by Prof. Erastus N. Njoka, Vice-Chancellor, Chuka University				
11.40-12.55pm	Presentation of Awards				
12.55-01.00pm	Vote of Thanks: Dr. Beatrice M. Mburugu Closing Prayer: Bishop Joseph Masinde				
1.00-2.00 pm	VIP/Organizers Lunch and Departure	BSRC 205			

Thank You All. Bon Voyage.

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1.	Suzanne Chebet	AB3/30245/17	0799-240254	Suzstar Enterprises	178
2.	Felix Odhiambo	CB2/37140/18	0796-090751	Independent Lens	182

3.	Phyllis Nkirote Joyce Mumbi Bilta Wambui	DB8/28634/16	0704-838211	Raise-Up Kenya Agronomic Outlets	184
4.	Faith Isaac	EB3/43470/19	0725432005	Unisek	187
5.	Robert Muli Mutua & Ruth Wambui Gichuru	BB3/33488/17 BB3/30882/17	0701-599515 0702-735355	Autumn Cosmetics	190
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8.	Kelvin Mutrithi Gitonga	CB4/25946/16	0796531451	Laps4hire	196
9.	Cyrus Njuguna	BB5/41301/19	0727734194	Msafiri App	202
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13.	Bethwel Kibet	BB6/27092/16	0712726756	Bizma Ent	210
14.	David Onyango Oduor	CB1/31369/17	0723972458	Expanding Small Businesses	-
15.	Robert Waweru	BB53/29386/17	0791282295	Mushroom Production	218
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KEYNOTE PRESENTATIONS

TECHNOLOGY AND INNOVATION SUPPORT CENTERS (TISC) PROGRAMME

Presenter: Paul M. Chege

Assistant Manager – Patents

KIPI

Overview

- An initiative by World Intellectual Property Organization (WIPO)
- Facilitates access to and use of Intellectual Property information, technological, scientific and technical literature; search tools and databases, and
- Builds capacity in developing countries to effectively support innovation, technology transfer, and commercialization-related services
- Provides innovators with access to locally based technology information and related services.
- Fosters innovation by building on rich technology information disclosed in patent documents, of which over 100 million have been published to date, and in scientific and technical publications.
- Established within a variety of host institutions, including patent offices, universities, research centres, and science and technology parks

WIPO supports effective operation of TISCs by:

- Facilitating access to Industrial Property Information including: patent databases and other scientific and technology resources;

- Training local users on-site and off-site;
- Providing information and training materials;
- Supporting awareness-raising activities; and
- Disseminating best practices and experiences among TISCs.

TISCs Benefits

- Provide a diverse range of basic and value added innovation support services,
- Helps inventors, researchers, and entrepreneurs to unlock their innovative potential.
- Supports services are provided by trained local staff and designed to promote access and effective use of valuable sources of technical and commercial information, such as patent information, scientific and technical journals, trade mark and industrial design information.

Basic services of a TISC

- Access to online patent and non-patent (scientific and technical) resources;
- Access to industrial property-related information and publications;
- Assistance in searching and retrieving technological information;
- Assistance in filing and prosecution of applications for grant and registration of Industrial Property Rights (IPRs)

Additional services provided by selected TISCs

- Patent drafting;
- Training in searching databases;
- On-demand searches (novelty, state-of-the art, and infringement);
- Technology and competitor monitoring;

- Basic information on industrial property laws;
- Basic information on industrial property management and strategy; and
- Basic information on technology commercialization and marketing.

WIPO Actively Supports

- In close cooperation with national and regional industrial property offices, continued training of TISC staff and users.
- Training is provided as a standard package and includes:
 - Local and/or regional training workshops and seminars;
 - WIPO Academy courses: distance learning courses; and
 - E-learning tutorial (from 2012).

Kenya Industrial Property Institute (KIPI)

- Signed a service level agreement with WIPO on 4th October, 2011 and became the designated focal point for establishment and coordination of the Kenyan TISC Network.
- Sensitization seminars were held to encourage institutions to establish TISCs.
- A number of institutions have already signed Memoranda of Understanding (MoU) with KIPI to establish the TISCs. These are:
 - Jomo Kenyatta University of Agriculture and Technology,
 - University of Nairobi,
 - Technical University of Mombasa,
 - University of Eldoret,
 - Sigalagala National Polytechnic,
 - Jaramogi Oginga Odinga University of Science and Technology,
 - Kenyatta University

- Sang’alo Institute of Science and Technology,
- Karatina University, and
- African Advanced Level Telecommunication Institute.
- Other public universities and Technical and Vocational Training (TIVET) institutions have also indicated their willingness to establish a TISC centre in their premises.

Chuka University’s TISC

The University Signed a MoU with KIPI on 13th November, 2019 and became the 12th TISC in Kenya.

EFFECTS OF FEMALE GENITAL MUTILATION/CIRCUMCISION ON THE TRANSITION OF GIRLS TO SECONDARY SCHOOLING IN NAROK AND KAJIADO COUNTIES, KENYA

KENYA NATIONAL COMMISSION FOR UNESCO (KNATCOM)
FINDINGS AND INTERVENTIONS, FEBRUARY 2020

Presenter: Nancy Njeri Mbugua

Background: Education-Cultural Practices

- Education is the greatest weapon to fight poverty, the equalizer and engine for socio-economic development, a basic human right.
- The right to education is a basic human right underpinning the 2030 Agenda “to leave no one behind” and “ensure inclusive and equitable quality education and promote lifelong learning for all” and Sustainable Development Goal 4
- SDG5 targets the elimination of all harmful practices, such as child labour, early and forced marriage and female genital mutilation/circumcision (FGM/C).
- FGM/C negatively affects access to and provision of quality education to girls, besides other social and health implications
- FGM/C is intertwined with the issues of early and forced marriage to older men, early pregnancies and girls dropping out of school

Kenya Government Position on FGM/C

Global Conference on Sexual and Reproductive Health

- “Kenya commits to eliminate female genital mutilation by 2022,”
President Uhuru Kenyatta

- “In addition, the country will eliminate all forms of gender-based violence and harmful practices by 2030 through the strengthening of coordination mechanisms and by addressing cultural norms that propagate these practices,”

Background 2: Kenya- Kajiado and Narok

- In Kenya: FGM/C has been singled out as the main harmful cultural practice that acts as a barrier to education for girls and their empowerment especially among the pastoralist communities.
- Narok and Kajiado are two Counties in Kenya, 90% of young girls are married off at an early age after undergoing FGM/C.
- In Kajiado, 20% of the girls begin child bearing at the age of 15-19 years; female circumcision is widespread in Kajiado County with 1 in 2 girls having undergone female circumcision (Ministry of Education)
- Narok County had the highest cases of teenage pregnancy in Kenya with an average of 40% cases against a national average of 18%.

Kenya Government Position on Education and Transition

MOE 100% transition to secondary schooling is compounded in some parts of the country by socio-cultural factors, including FGM/C and related factors in particular.

Study Objectives

1. Nature and Status of FGM/C

- Terminology, Perceptions, Prevalence
- Types, Reasons, Socio-economics
- Trends

2. Effects of FGM/C

- Psycho-social Effects
- Health and reproductive effects
- Early Marriages
- Transition to Secondary School

3. Interventions/Recommendations

- Existing interventions
- Recommended Interventions

The Study: Field Background and Preps

- Study Team: Multi-sector team of experts from the KNATCOM, Universities, Civil Societies, non-governmental organizations, the Ministry of Education, County governments
- Literature Review and Field Preps: Desk top study and review of relevant legal and policy documents and reports on the nature and status of FGM/C viz. Education
- Development of Research Instruments and Piloting in Baringo, refinement of study tools and field logistics preps
- Field Study in Kajiado and Narok Counties, two separate teams of 8 persons in each lead by KNATCOM personnel

Study Methodology and Materials

- Mixed Approach of Both Quantitative and Qualitative Methods: Questionnaires, Interviews, Focus Group Discussions
- Target Respondents: FGM/C and education related representatives, pupils/students, FGM/C victims and champions, school head teachers, school guidance and counseling teachers, health sector

practitioners, community, and government administrative representatives.

- In each county, the study focussed on two discrete sub-counties, with varying socio-economic and cultural characteristics, and levels of FGM/C prevalence; roughly urban/peri-urban and rural
- Study Areas
 - Kajiado County: Kajiado Central and Kajiado West
 - Narok County: Narok South and Transamara

Nature and Status of FGM/C

Terminology

“the partial or total removal of the female external genitalia or other injury to the female genital organs for non-medical reasons” WHO

Maa: Emuratare entoiye – circumcision of girls

“Intashaa amuitaa enkitok” meaning “stand up, you are now a woman”

The opposite is a child, cabbage, negative

Perception: “do not equate the practice to anything wrong... emuratare is not stealing a cow which we know is breaking the law. It is for one’s good and it makes one respected”

Prevalence

- Varies with respondents- Educationists, government officials, and those from outside the community
- FGDs are non-committal to specific percentages- “this thing is quite common especially among families who do not value education. Strict church goers also do not get their girls circumcised”
- Law enforcement: Low where chief is not strict, but related to reporting

- Peri-urban revealed a 40% level of prevalence in both Narok and Kajiado Counties, while in rural areas; Narok had a 70% prevalence compared to Kajiado's 50 prevalence.

Types: Clitoridectomy- 97%, and milder procedures of cuts and not cut-offs

- **Reasons: Two Categories**

- Woman's sexuality and reproductive benefits (e.g. control of a woman's sexuality, baby's birth, submissiveness,
- Rite of passage (person and society), social identity, social order and structuring

- **Decision Making (who plays what role and how significant)**

Victim/Girl, Parents (father vs. mother), Community, Suitors

- **Socio-economic Correlates**

- Education
- Income
- Religion

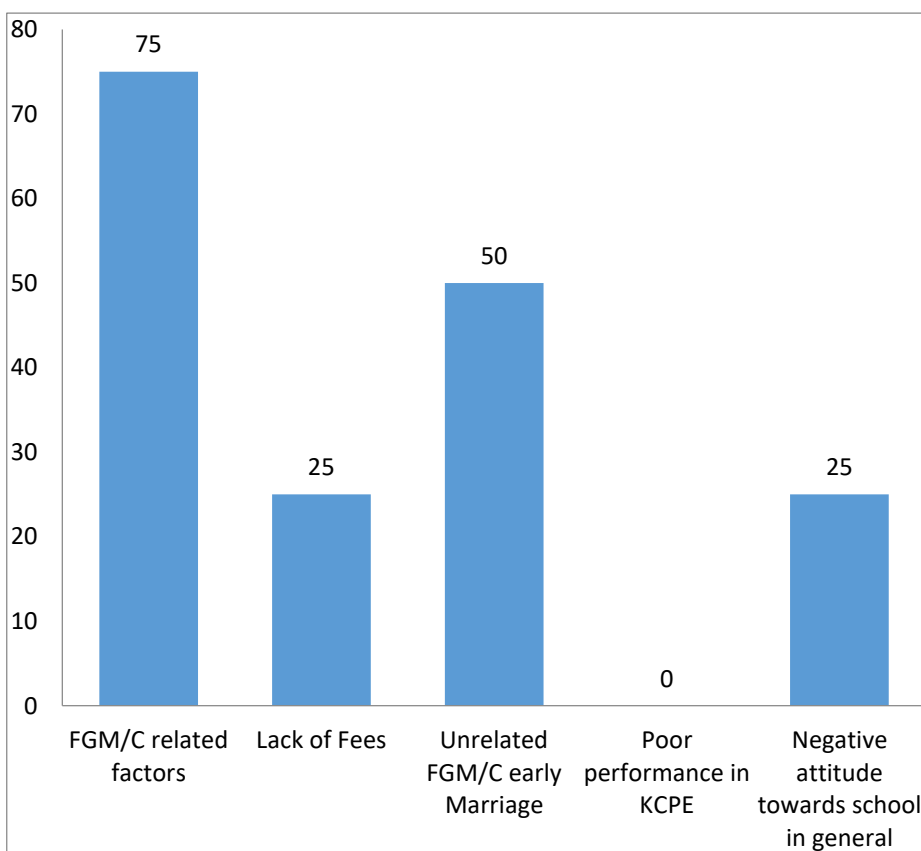
Trends

- Prevalence (reduced, law enforcement, value on education)
- Public vs. Secrecy
- Expectant mothers undergoing the practice
- Season (any time vs. holidays)
- External facilitation
- Medicalization
- Age of the girls (younger girls)

Patterns of FGM/C Related School Transition

- Gender balance in lower primary school but much higher ratios against girls in class 8 and Form 1.
- Lower than 30% percent transition to secondary school among girls reported and even lower figures in Form 3 and 4
- Differences between peri-urban and rural schools
- Interesting to note cases of more than 90% FGM/C victims in class in Secondary Schools (esp. boarding Schools)
- Early marriage and drop-out is not automatic

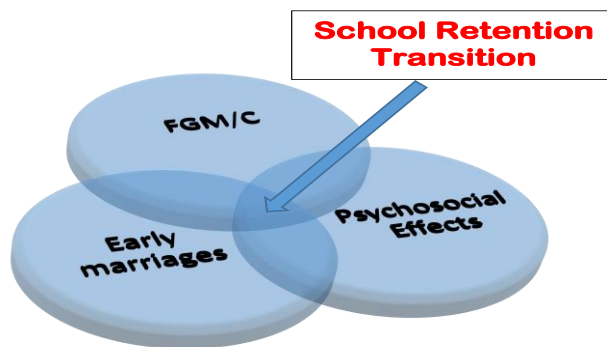
Rating of Role of Various Factors in Transition



The Triple Nexus of FGM/C and Effects

- FGM/C encourages psycho-socially supported freewill for sexual relations, targeting suitors, and acceptance by parents and community
- Freewill and targeting for sexual relations lead to early pregnancies, which leads to early marriage and school drop out
- FGM/C is a precondition for marriage (compounded by other compelling reasons, eg. Poverty, strong cultural predispositions)
- Desirability for marriage due to family and peer pressure translates into desirability for FGM/C

Relationship among FGM/C, Psychosocial Effects, Early Marriages and School Transition



FGM/C and Psycho-Social Factors

- Psycho-Social Factors Preceding FGMC- Peer pressure, social and cultural environment, family
- Desirability (aspiration to adult/womanhood) and/or Compulsion (by peers/family/community) for FGM
- Feeling of Freedom of an adult and woman
- Change in identity and Social Status

- Acceptance by peers, parents, community- reifies her new status
- High self-esteem, authority, empowerment, personal freedom to make decisions
- Personal and physical freedom for sexual relations
- Heightened suitor activity, parental encouragement
- Early Marriage/Early Pregnancy/Drop from School

FGM/C and Schooling/Drop-Out

- Many FGM/C-ised girls continue with Schooling or transit to Secondary Schooling
- With change of identity and status, in School, they begin to isolate themselves and look down upon the uncircumcised girls
- The circumcised girls are uncontrollable – “they become rude and arrogant to their teachers”
- Relationship with especially female teachers deteriorates because the girls perceive them as equals.
- They become indisciplined and view schools as a hostile environment. Begin to lose interest in schooling.
- School absenteeism among girls who are circumcised is high. Their performance in school drops because, don't concentrate as they become more conscious of themselves and their status, and take more interest in relationships with boys.
- Parents take advantage of the girls who have lost interest in schooling to encourage them to get married.

FGM/C and Health

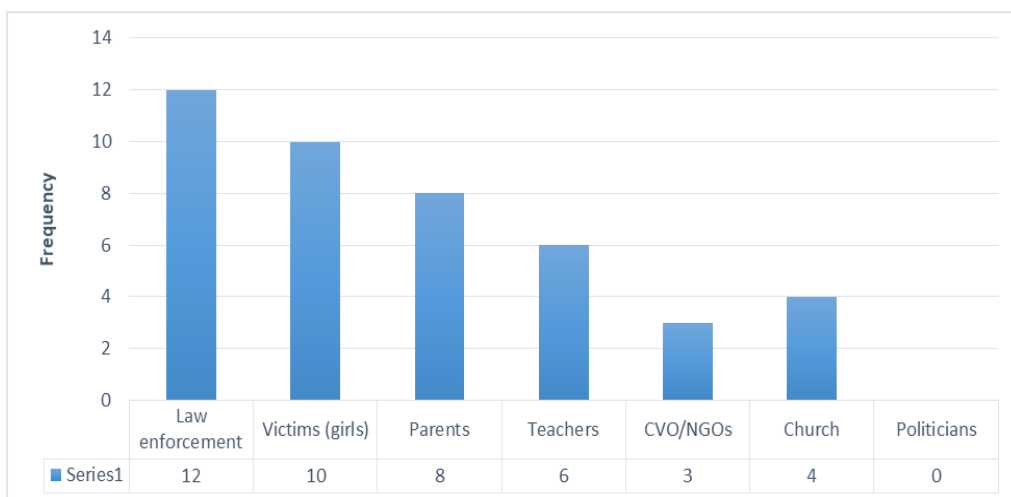
- Prevalence of FGM/C related health issues reported as “very low”.

- This is due to lack of reporting rather than the actual level of occurrence. Only severe cases are reported.
- Very few cases of FGM/C related ill-health cases are reported, as victims fear law enforcement against the practice
- Fewer experienced traditional circumcisers and its secrecy undermines health care interventions
- Most health cases reported coincided with childbirth, many are not aware of the link, compounded by low levels of antenatal care
- Medicalization of FGM/C is contributing to fewer cases of ill-health
- In Kajiado, 40% of the women seeking MCH services are below the age of 18 years
- Ill-health, FGM/C related or not is a good excuse to drop from School; Few cases however reported

Non-FGM Related Factors and School Transition

- Home environment- Poor attitude to Post-Primary Schooling that is supported by traditional systems of livelihoods
- High poverty levels- even with free primary schooling, any excuse of fees is used.
- “Circumcised girls who go to schools that have a conducive learning environment will stay in school...the girls drop out because many schools do not have enough teachers and resources to support girls from poor families. When homes are not conducive and schools are also not conducive, the way out for such girls is marriage”
- An Educationist in Narok
- These factors were very lowly rated
- Other factors: levels of law enforcement, role of the church

Matrix Ranking of Interventions



3. Interventions to prevent FGM/C and mitigate effects

ACTORS	REMARKS
Law enforcement institutions	Chief- a critical actor, highly rated with some exceptions; most with circumcised wives, and daughters circumcised; delicate balance between popularity and law requirements Police: Transfer the responsibility to chiefs
Victims (Girls)	A critical actor, their willingness encourages parents and suitors; fear of repercussions from parents; ineligibility for marriage
Parents	A critical player; depends on their status in society, education, socio-economic background. Fathers and mothers are equally involved, mothers more as facilitators
Schools	Critical actors in awareness, rehabilitation and retention in schools

Community	Mixed responsibility; decision not a collective community issue, live and let live attitude;
Civil Society/NGOs	Critical actors; especially in awareness and rehabilitation; impact is seen to be not as critical as law enforcement
Church	An emerging critical actor; alongside schools; many church goers negative with the practice;
Politicians	Most lowly ranked actors; more keen to protect their positions which they risk by supporting the practice.

RECOMMENDED INTERVENTIONS

- Strategies: Broad and Overarching
- Objectives: Aligned to KNATCOM’s mandate and study
- Target Groups: Girls/Victims, Schools, Community, Govt/NGOs, CSOs
- Activities: Actionable, in line with stakeholders

Broad Intervention/ Strategy	Specific Intervention (Objective)	Activity And Target Group
Capacity and Resilience Building for youth	Enhance knowledge and awareness among youth and strengthen their resilience	<ul style="list-style-type: none"> • Develop and support youth programmes for alternative rites of passage • Support and use of male youth (Moran) as stewards of anti-fgm/c programmes • Use youth cultural activities to enhance knowledge and awareness of FGM/C (e.g. Moran initiation ceremonies) • Engage youth in alternative livelihoods and spearheading FGM/C activities and messages (e.g. boda boda riders) • Support for out of school girls in

		<p>entrepreneurial ventures and use them as role models</p> <ul style="list-style-type: none"> • Target groups: youth off school, morans, • Identification of youth groups and engagement activities
Exposure, Knowledge Sharing and Awareness Fora	<p>Enhance knowledge and awareness of higher learning and career development opportunities among primary and high school learners</p>	<ul style="list-style-type: none"> • Visits of learners to institutions of Higher Learning and Interaction with University students, lecturers, and career role models. • Participation in selected Universities activities such as career week, culture week and open days • Awareness Visits to Schools/community of University students, lecturers, and career role models • Learners Participation in Career and Education Desks at Selected Sub-county/County Schools Activities (Sports, music and drama festivals)
Guidance and Counselling in FGM/C	<p>Equip teachers with Knowledge and skills in guidance and counselling, Offer G and C support to school girls and FGM/C victims, boys and parents</p>	<ul style="list-style-type: none"> • Training seminars and workshops for Guidance and Teachers • Guidance and counselling sessions for school FGM/C victims and girls who have not undergone the practice • Peer counselling and experience sharing • Development, Production and distribution of knowledge and Awareness materials and resources
Gender Responsive pedagogy and Capacity Building	<p>Enhance gender pedagogical knowledge and skills of FGM/C related factors and school transition for teachers</p>	<ul style="list-style-type: none"> • Training seminars and awareness workshops in gender pedagogy for teachers • Development, Production and distribution of gender pedagogy materials and resources

Mentorship and Career Advising among teachers and youth/school going	Equip teachers and learners with knowledge and skills in social and career wellbeing	<ul style="list-style-type: none"> • Training Workshops for Mentorship and Career Advisors • Mentorship and Career Advising sessions for learners • Public Lectures by role models and champions in Schools
Enhancement of Policy Interventions and Stakeholder Coordination	Enhance the knowledge base and opportunities for integrated interventions among key FGM/C and education stakeholders	Stakeholder workshops for knowledge and information sharing Target Groups: MOE, TSC, CSOs, NGOs, Universities
Social Harmony and Rehabilitation for victims of FGM/C and affected persons	To facilitate understanding, acceptance and reconciliation among various groups affected FGM/C	Workshops, Reconciliatory and re-union meeting/sessions with families and individuals experiencing friction due to FGM/C
Enhancement of Community Livelihoods and socio-economic well-being	Compliment FGM/C Interventions with initiatives for the enhancement of community livelihoods and wellbeing	Capacity Building Seminars and workshops in entrepreneurial knowledge and skills enhancement for community groups



OVERVIEW OF THE UNESCO NETWORKS

Presented by: Nancy Mbugua

Education Programme

KENYA NATIONAL COMMISSION FOR UNESCO (KNATCOM)

- UNESCO was established in 1945 after the Second World War with the aim of contributing to peace in the world, based on the premise that **“since wars begin in the minds of men and women, it is in the minds of men and women that the defences of peace must be constructed”**.
- These words no doubt, make it clear that following the war, mankind was forced to reflect on the nature of war and peace.
 - Kenya became a member of UNESCO in 1964 and KNATCOM was established in the same year and was placed as a Directorate under the Ministry of Education.
 - In January, 2013 KNATCOM became a State Corporation through the enactment of the Kenya National Commission for UNESCO Act 2013.
 - The Commission derives its mandate from the UNESCO Constitution, Charter of the National Commissions for UNESCO and the Kenya National Commission for UNESCO Act 2013.

- As a State Corporation with international visibility, KNATCOM is the principal link between the national priorities of Kenya and the multilateral agenda of UNESCO.
- KNATCOM is the focal point for all UNESCO programmes and activities in Kenya. The Commission therefore has a unique role to play in strengthening the foundations of lasting peace and sustainable development through intellectual dialogue in the areas of education, sciences, culture, and communication and information Programmes.
- These programmes are supported by specific programme and expert committees drawn from relevant ministries, government agencies, academia and private sector.

UNESCO NETWORKS

- UNESCO has several networks under Education Programme, they include UNESCO chairs best suited for universities and research institutions, UNEVOC centres for TVET institutions, UNESCO clubs best suited for learning institutions as well as organisations including churches and Associated Schools Project Network (ASPNET), best suited for learning institutions including colleges and TVET institutions.
- University education to be accepted as a chief provider to the demands and challenges of the modern technological era - in the course of the proficiencies and acquaintance of the degree holders to be taught in that way that they meet challenges of the world at large.
- While Universities are expected to play very specific roles in promoting sustainable development through their traditional functions of teaching, research and knowledge dissemination, there is

a growing consensus that our current paradigms are inadequate for addressing the long term needs of a sustainable future.

- It is necessary for Universities to fill the gaps by updating strategies and procedures to accommodate the resilience required to progressively adapt to changing physical, historical and social conditions in order to play an active role in shaping a more sustainable future. They have a responsibility of taking care of the society and getting rid of the all the hurdles in the way of sustainable socioeconomic development. As the only UN agency with a mandate in higher education, UNESCO helps develop evidence-based policies in response to new trends and works to make education more inclusive and innovative.
- Universities are supposed to help the society at large to make familiar with the various challenges of continuous development processes. It also helps the get abreast of the various social and economic aspects of human life. The hands on oriented training and practices in many cases can be transformed to the society and be utilized there.
- Associated Schools Project network will work towards promoting peace and sustainable development among an informed citizenry that is capable of strengthening democracy and development in Kenya.
- The patrons Handbook helps them in their activities. They are usually inducted in one-week training and later follow up and regular reporting of activities is done.
- These Networks in the wake of the SDGs, Vision 2030 and Kenya Government big four Agenda are very important
- Universities are expected to provide leadership, partnership and the much needed networking for the realization of SDGs.

THE SUSTAINABLE DEVELOPMENT GOALS



Physical Location: Nairobi, Kenya

National Bank Building 14th Floor (Harambee Avenue) Tel: +254 (0) 20
2229053/4,

Website: www.unesco.go.ke,

Email: info@unesco.go.ke/sg@unesco.go.ke

LinkedIn: NatcomUnescoKe

Facebook @ Kenya National Commission for UNESCO

Twitter @NatcomUnescoKe

OVERVIEW OF THE INNOVATIONS ECOSYSTEM IN KENYA

Presenter: Gideon Kivengea

KENIA



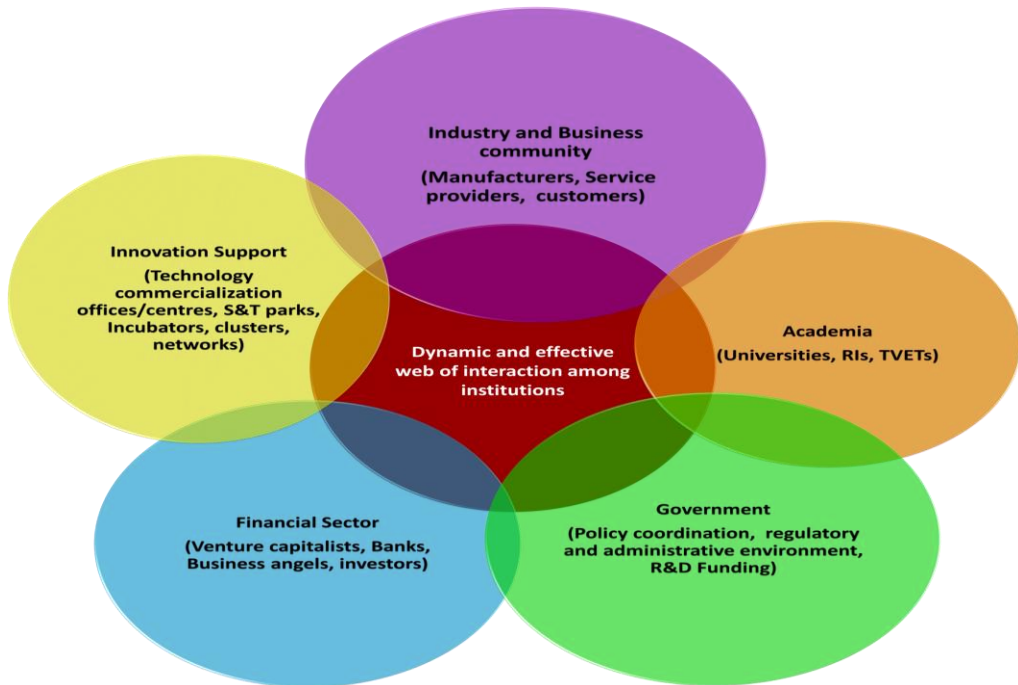
Innovation

- If you do something that's been done 100 times before, you can't call it innovative;
- But on the flip side, just because you come up with something “**new**” or “**novel**”, you can't necessarily call it innovative, either;
- Innovation implies not only newness, but a sense of **unique utility**.



Innovation Implies Not Only Newness, But a Sense of Unique Utility

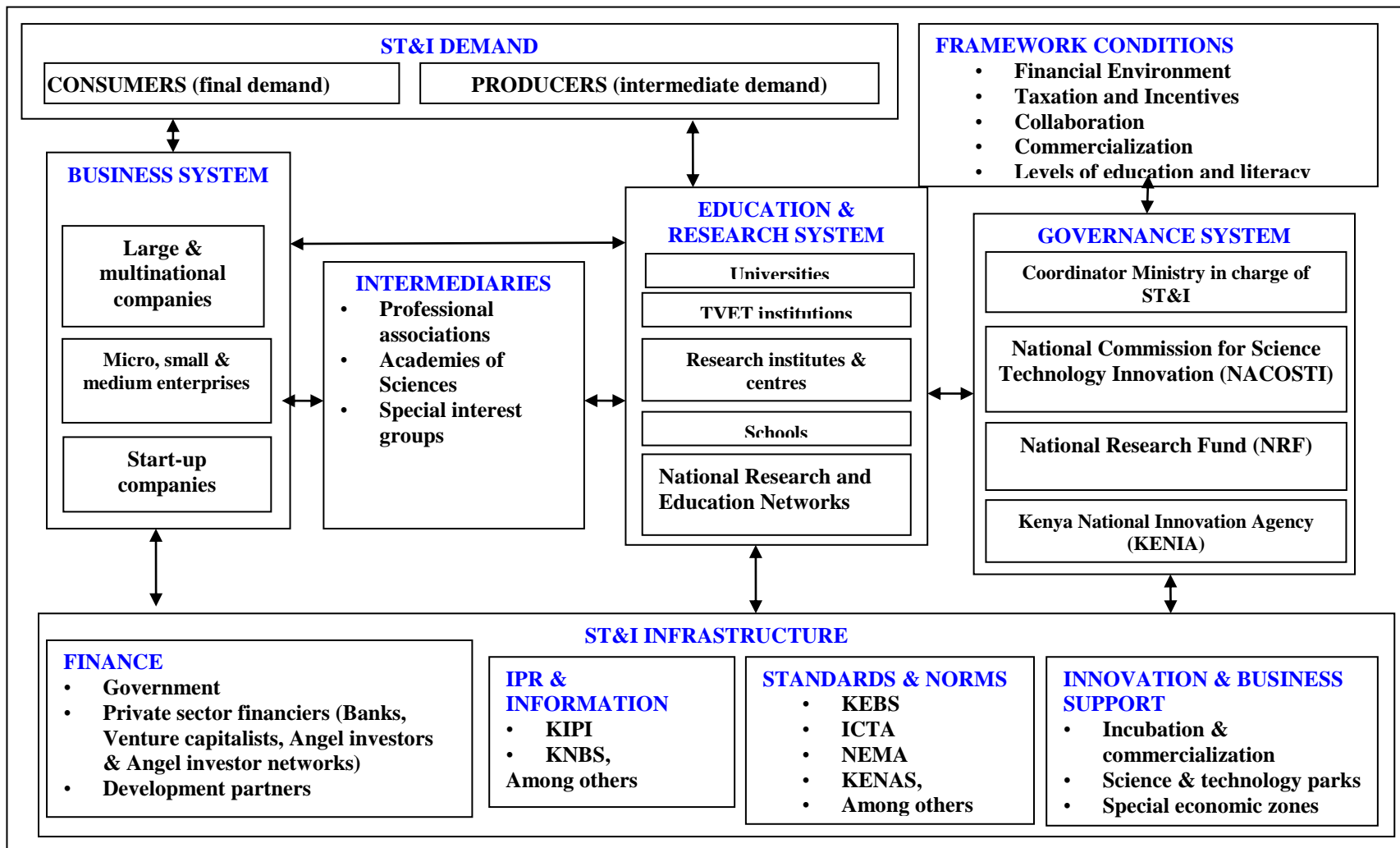
The Kenya National Innovation Agency (KENIA) is mandated to develop and manage the national innovation system



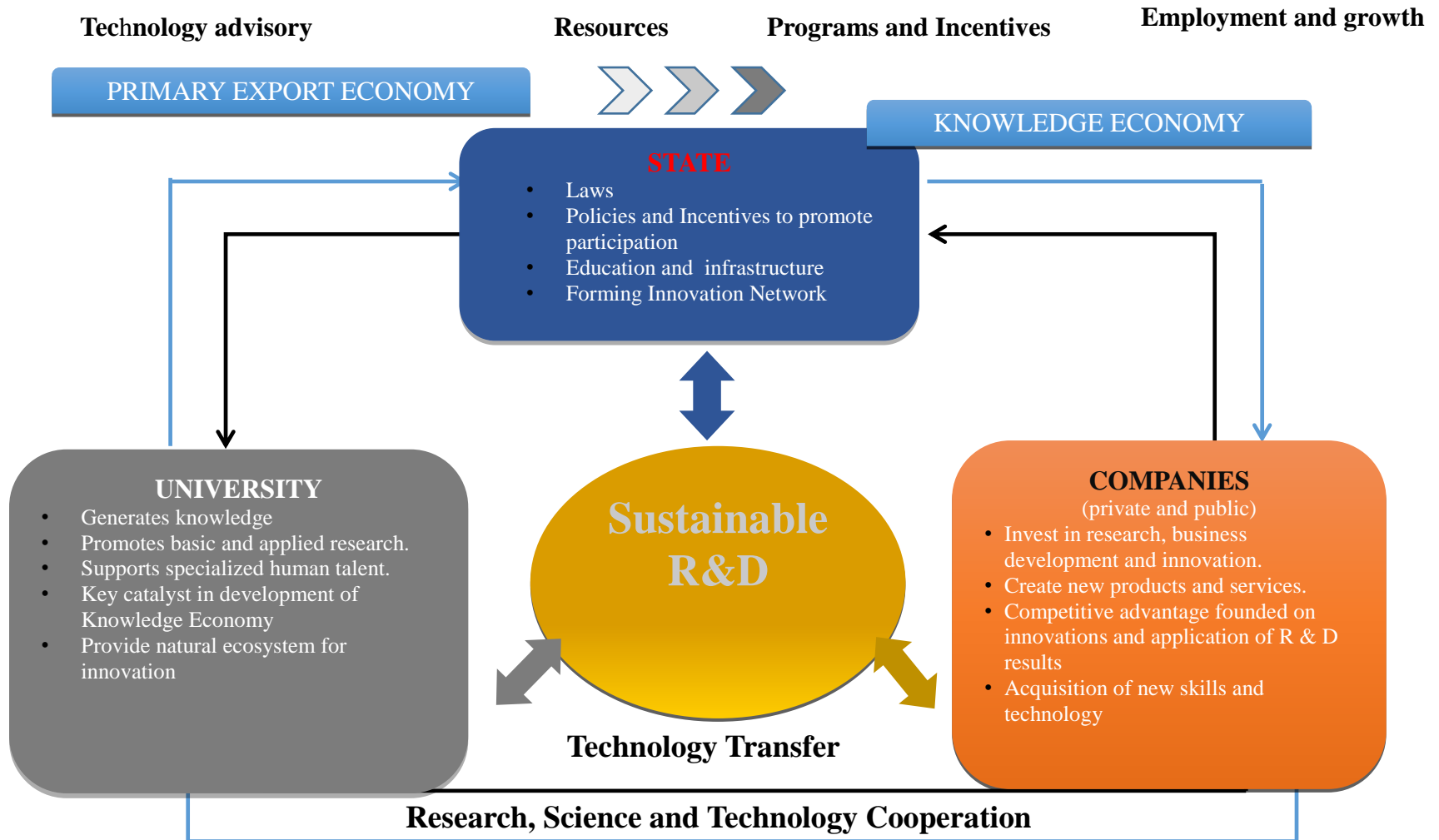
Functions

- Scout for and nurture innovative ideas – individual and institutional;
- Establish and maintain award scheme for innovations;
- Linkages - Academia , Industry, Government and other actors in the system;
- Establish and maintain a database on innovation;
- Increase awareness of IP among innovators.

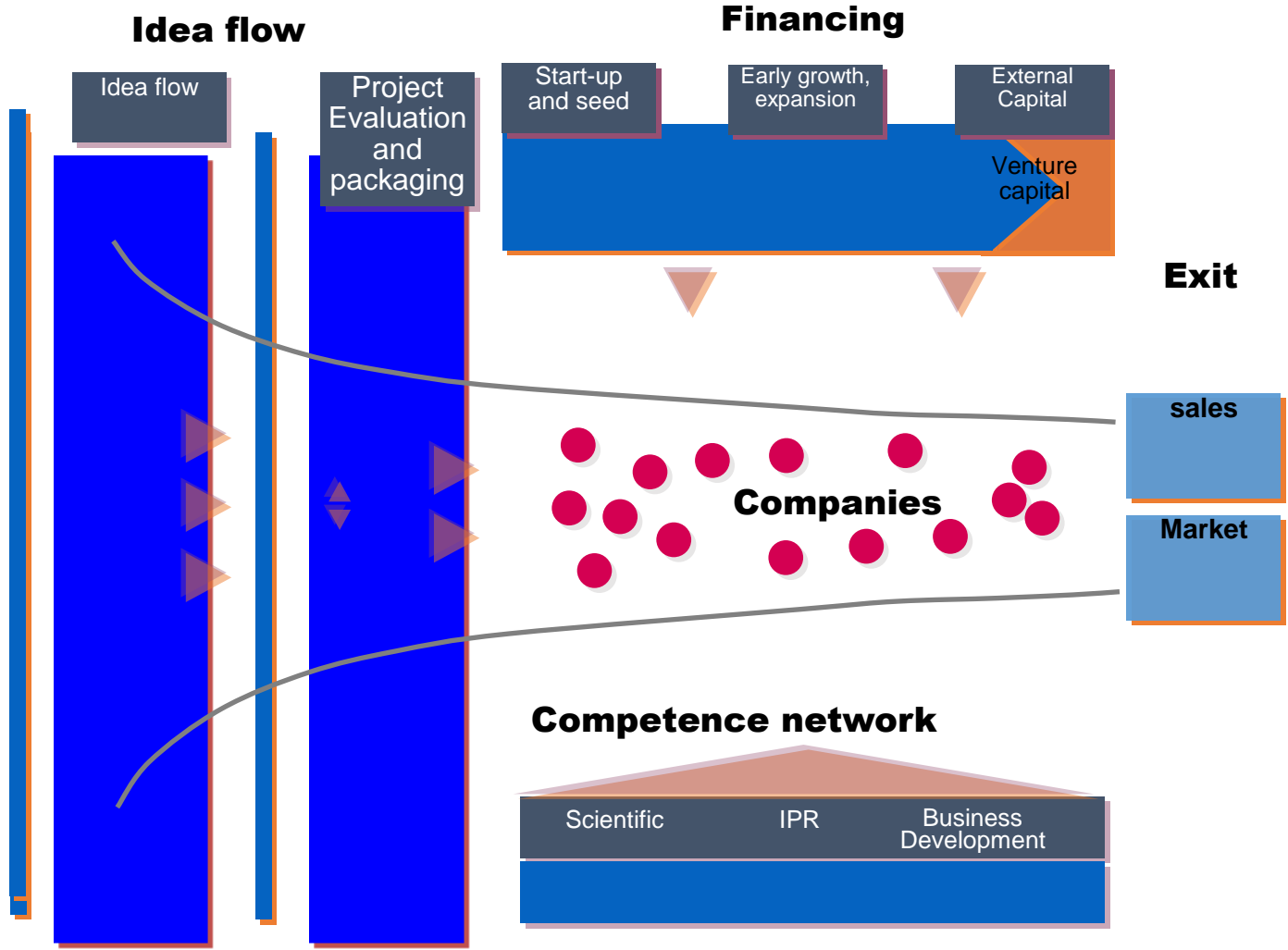
Kenya National Innovation System (KNIS)



Key Actors of the Networks and their Roles



The role of universities from idea to exit



Innovation Development Theories

Technology push vs. Market pull

Technology push

Research & Development



Production



Marketing



Need?

Market pull (demand pull)

Research & Development



Production



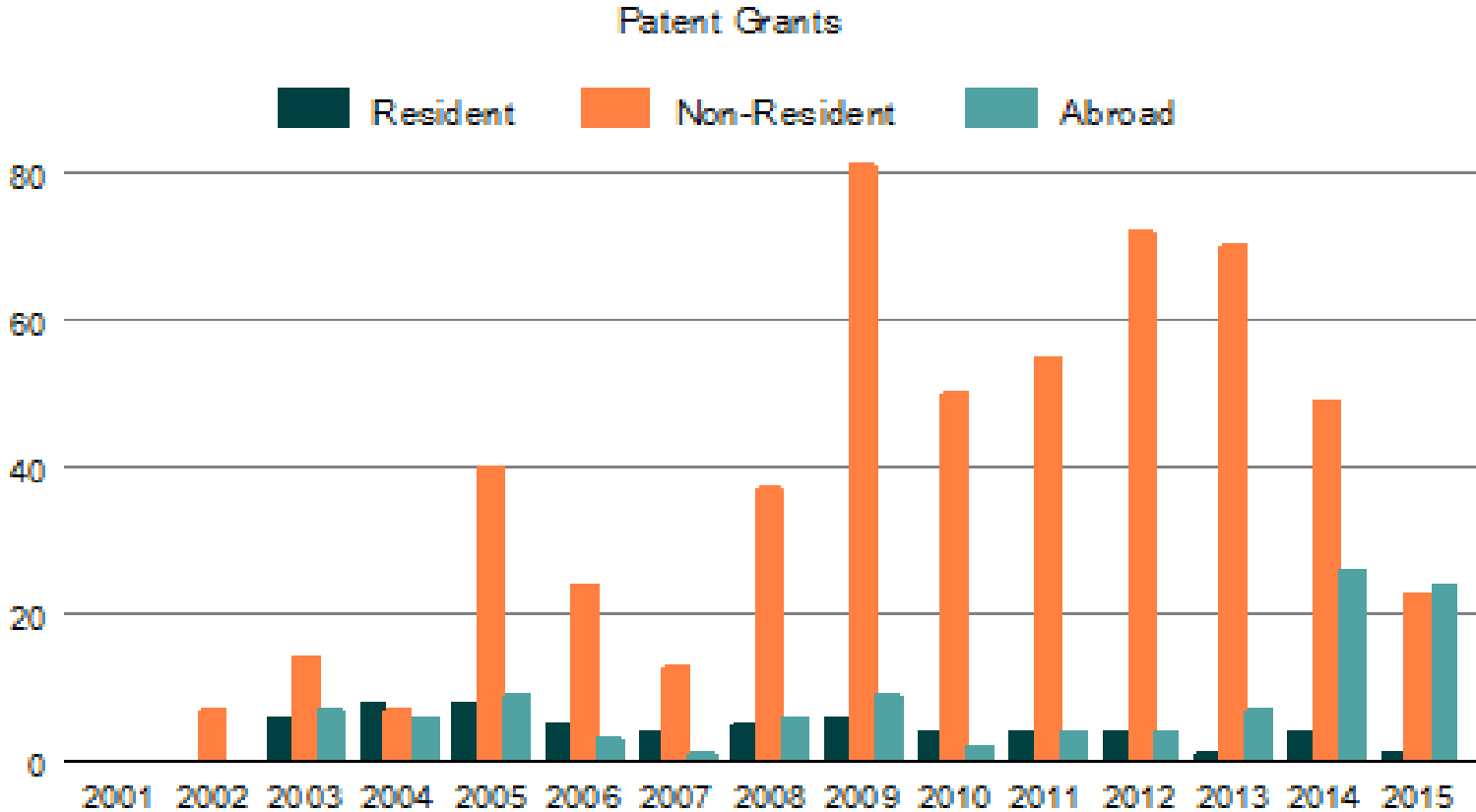
Marketing



Expressed
Market
Need



Kenya: Patent Grant



Source : WIPO statistics database; last updated: 05/2017

IP Awareness

- **Patent:** where product could easily be reverse engineered;
- **Copyright:** most useful to protect artworks, literary, cinematographic and musical works;
- **Designs:** best used in conjunction with other forms of IP;
- **Trade mark:** supporting brand and developing good will;
- **Plant breeders' rights:** new plant varieties;
- **Trade secret:** useful for processes (where you can't easily detect or prove infringement), where you need protection for more than 20 years.

Global Innovation Index - 2019

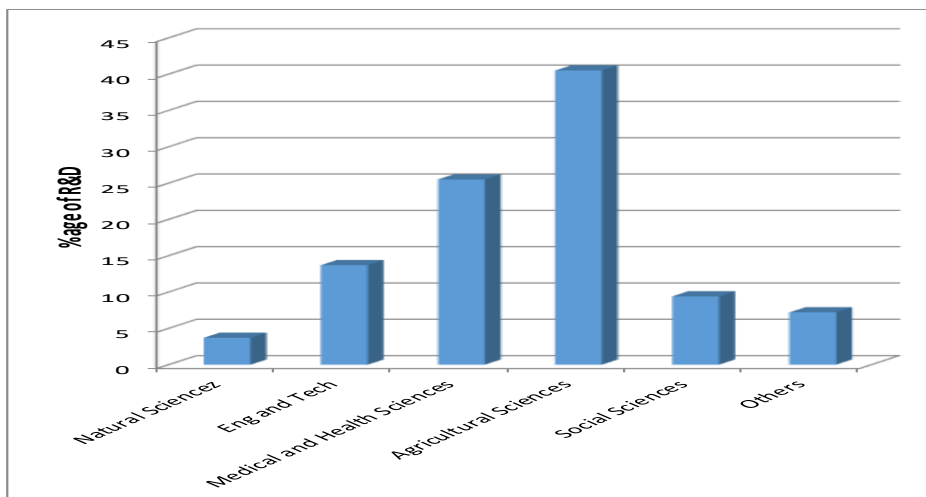
Country	Rank
South Africa	63
Morocco	74
Kenya	77

(129 countries)

Innovation Priority Areas

The need for prioritization arises from;

- The typical imbalances in the different R&D sectors and sectors contribution to socio-economic growth. The need for prioritization arises from;
- The typical imbalances in the different R&D sectors and sectors contribution to socio-economic growth
- Innovation Prioritization follows the same trend as the Research Science Technology and Innovation (RST&I) priority areas:
- Main policy documents that guide innovation prioritization include: The Constitution, Vision 2030, the ST&I sector Medium Term Plans, ST&I Act 2013 and the Jubilee Manifesto (the Big Four)



Problems Facing Our Communities:

- 1) Health burden: HIV/Aids, Malaria, TB, non-communicable diseases like heart disease, diabetes, obesity and malnutrition
- 2) Social burden: Gender violence, inequality
- 3) Economic burden: Growth needed to support growing populations, unemployment, unequal spread of wealth
- 4) Environmental burden: Food, water and energy security, pollution, loss of biodiversity, global warming



Innovation Priority Areas..Cont

- Innovation Prioritization follows the same trend as the Research Science Technology and Innovation (RST&I) priority areas:
- Main policy documents that guide innovation prioritization include: The Constitution, Vision 2030, the ST&I sector Medium Term Plans, ST&I Act 2013 and the Jubilee Manifesto (the Big Four)



Ongoing Programmes

- 1. Leaders in innovation fellowship** –Innovation Leadership Programme is a collaborative programme between the Kenya National Innovation Agency (KENIA), the National Research Fund (NRF) – Kenya, and the Royal Academy of Engineering (RAEng)-UK. The programme is implemented under the umbrella of Kenya-UK Newton Fund Programme.

- 2. National innovation awards** - The purpose of the award is to stimulate and strengthen the national innovative capacity and culture within the system of innovation in Kenya. The objective is to motivate and recognize innovators, as well as encourage innovation in national priority areas.



Ongoing ProgrammesCont

The current call was based of the following thematic areas:-

1. Agriculture and Food Technologies
2. Medical Technologies and Health Solutions
3. Built Environment and Housing Technologies
4. Manufacturing, Engineering and ICT
5. Renewable Energy



Selection process

1. These are annual competition events organized by the agency
2. Advertisements for the competitions are made in the most popular daily newspapers and posted in the KENIA website.
3. To allow for a fair, honest and equitable assessment of each applicant, the agency constitutes an independent panel of Judges composed of experts nominated by relevant institutions
4. Based on agreed criteria, the panel selects the best innovations to be awarded.



Leaders in innovation fellowship

1. The best 15 selected candidates attend a two-week capacity building Programme in the UK sponsored by RAEng under the Newton Fund
2. After that, the innovators are required within one week to submit to KENIA their innovation business plan
3. The innovation business plans are evaluated by an independent panel of experts
4. The most viable business plans are selected and awarded commercialization grants – to a maximum of Ksh 5 million
5. Innovators are supposed to be affiliated to innovation hubs of their choices through which the funds are channeled



National Innovation Awards

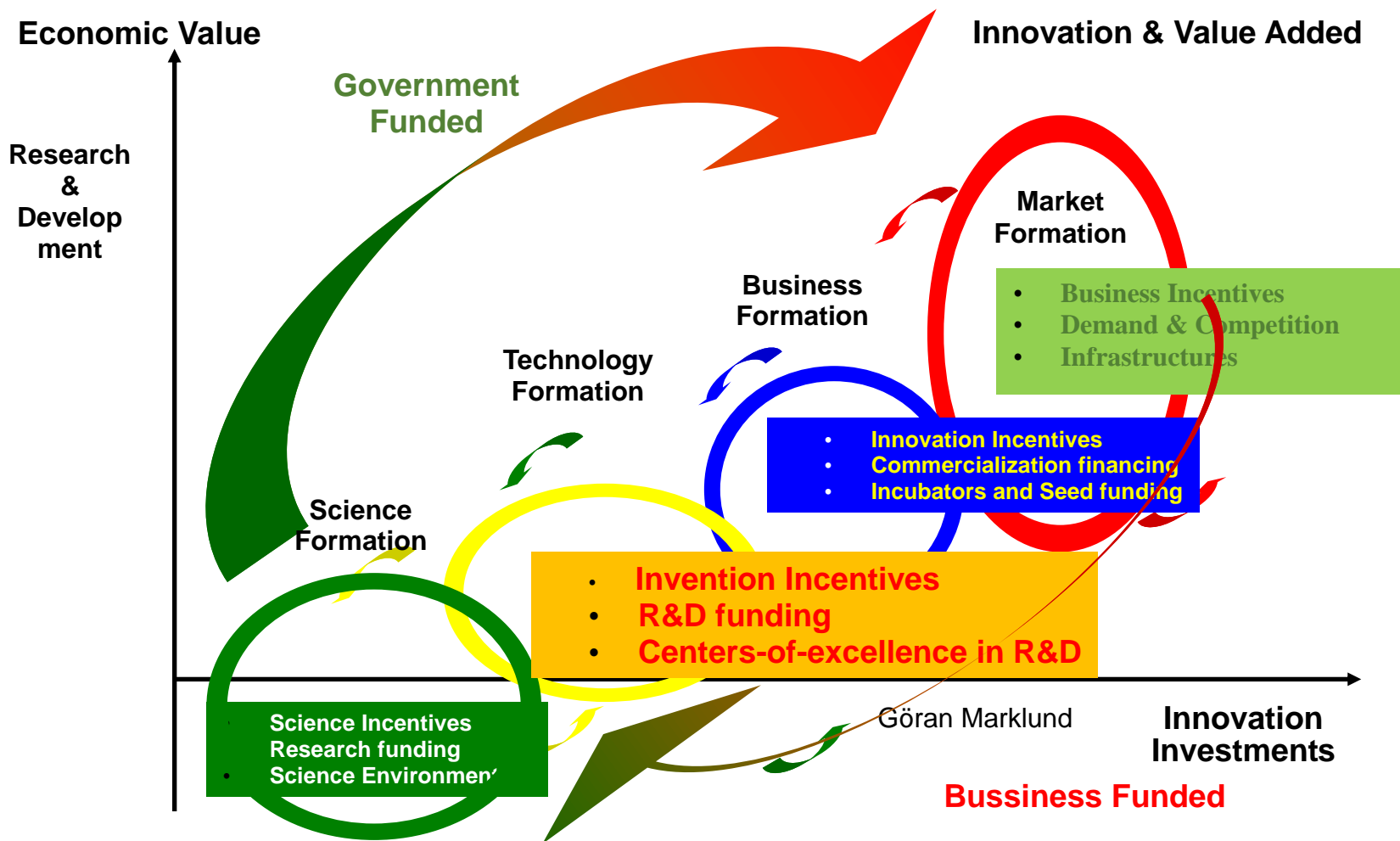
1. Each of the 5 innovators is awarded Ksh 800,000
2. The innovator is supposed to use the money in scaling up his/her innovation
3. To ensure this is achieved, the funds are channeled through innovation hubs of the innovators choice.



Evaluation

- An appropriate plan has been laid out to monitor the progress of innovation projects - outcomes/ milestones?
- Multiple methods of evaluation are encouraged;
- The nature (internal or external) and capacity of the evaluators;
- Is there continued funding and/or an ability to self-sustain the project after the grant period has ended?

Government Funding





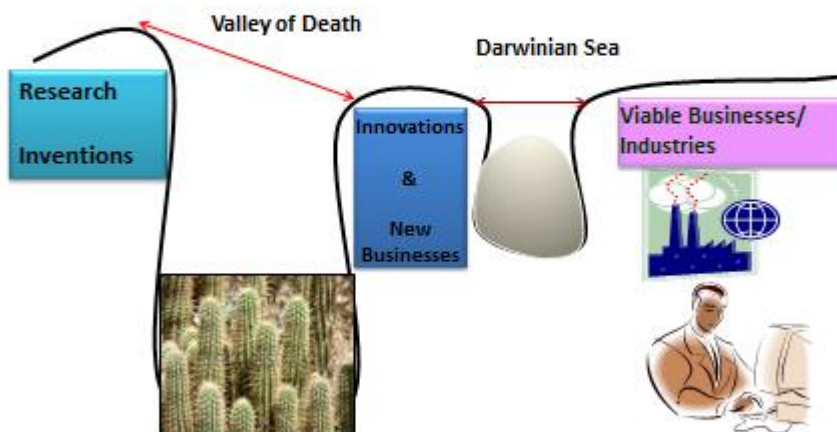
Other funding opportunities



Innovate
UK

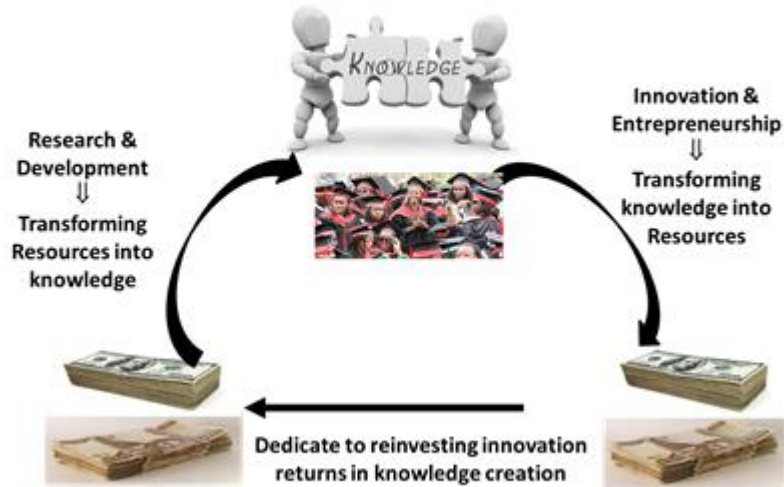


The Journey has challenges...BUT Determination should get us there





Complete cycle of knowledge to resources



Remember

Your application is just one of the many other applications the agency will receive, therefore create some interest on it:



**EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD):
GLOBAL CITIZENSHIP EDUCATION (GCE) AND THE
SUSTAINABLE DEVELOPMENT GOALS (SDGS)**

Presenter: Dr. Christine Owinyi


Kenya Education Management Institute (KEMI)

Introduction

Kenya Education Management Institute (KEMI) is the capacity building agency of the Ministry of Education with the mandate of providing training to education managers of various cadres, conducting research and offering consultancy services to organizations both in the public and private sector. The Institute executes its mandate through partnerships.


Office of Career Services Course for Universities and other Institutions

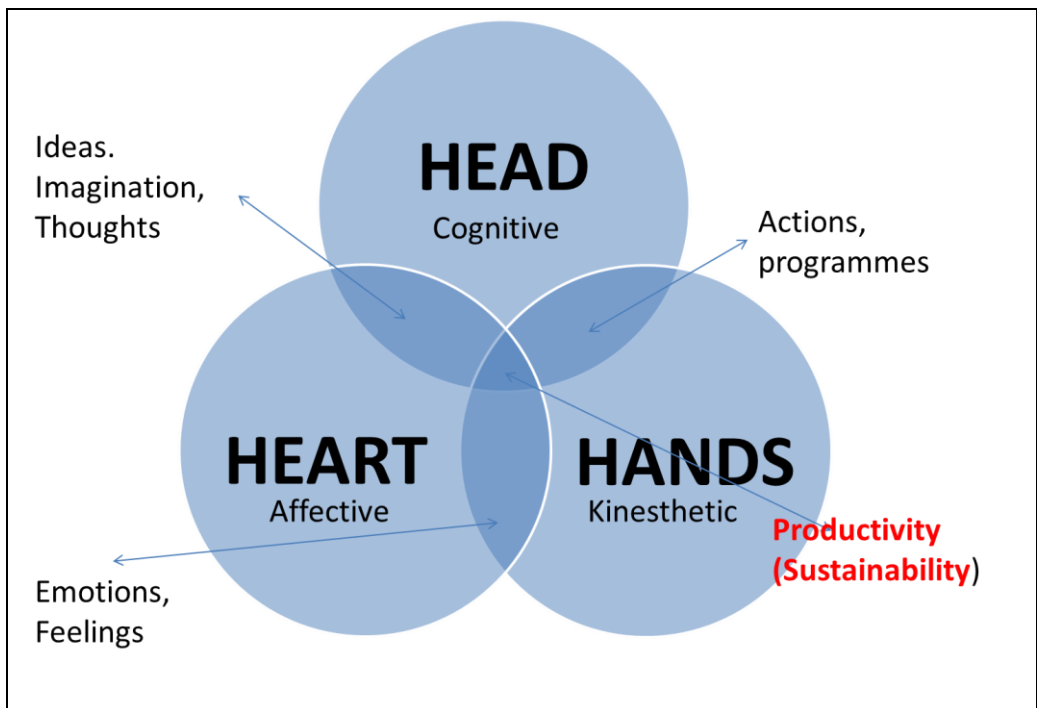
By leveraging partnerships, KEMI spearheaded the development and implementation of Office of Career Services (OCS) course and training of officers on behalf of the Ministry of Education-State Department for Post-Training and Skills Development.

<p>Youth Unemployment in Kenya Unemployment (not working, available and looking for work)</p> <ul style="list-style-type: none">• Kenya has an overall 7.4% unemployment rate.• About 85% of the unemployed are aged below 35yrs.• Largest unemployment rate was in the age cohort “20 – 24” at 19.2%.• Female constituted 64.5% of the unemployed.	
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Objective:

Facilitate, Lead, Challenge, Provoke, Stimulate, Inspire, Motivate, Support and Influence.

<p>The answer is: If not me, who? If not now, When? If not in this room, where else?</p>	
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SUSTAINABLE DEVELOPMENT GOALS

The Vision of Kenya within the Global context



Who is in the World?

Kenya has the best teachers in the World: Science and Mathematics teacher, Peter Mokaya Tabichi, wins the Global Teacher Prize for 2019.



Kenya teacher crowned world's best

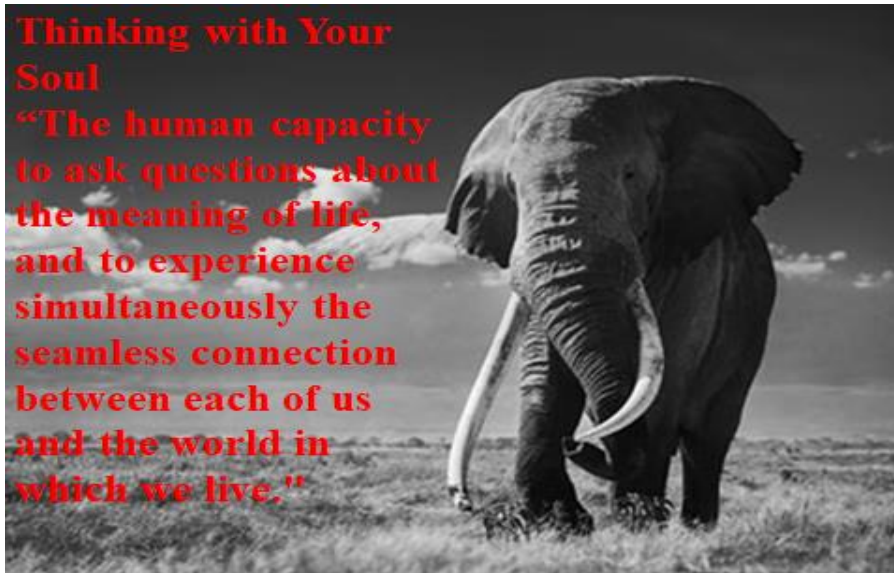
- Peter Tabichi says, "Every day in Africa we turn a new page and a new chapter."
- He appealed to teachers to focus on students' needs and mould them into innovators to better their skills.
- "Let them have passion and love for what they do. It should not just be about the salary but what the students need to fit in the modern society,"
- He has dedicated 70 per cent of his monthly salary to help the students and community around.
- He added, "When you help others you get tremendous rewards and the joy one receives satisfies the heart."
- May what we do with our Hands originate from the Head and satisfies our Heart.
- "We have the capacity to do great things but the only problem is that we lack confidence".
- "Many students across the country hail from poor family set ups and if as teachers we can devise ways to help them overcome, then we make them better citizens," Tabichi said.

AFRICA UNION CONTINENTAL TEACHER PRIZE

- A Kenyan teacher **Erick Ademba**, a *Mathematics teacher at Asumbi Girls High School, Homa Bay*, is among three honoured with a continental prize, for remarkable contribution in education.
- The award includes a recognition certificate a cash prize of **Sh 1,000,000**.
- The TSC nominated Ademba, who was 2018 Teacher of the Year (TOYA) 1st runners up, together with **Damaris Mwende of Mbooni Boys** who was also the 1st runners up of ICT Teacher of the Year (ITOYA) 2018.

- The two teachers competed against 50 other nominated teachers from the five regions in Africa.

So what is our problem?



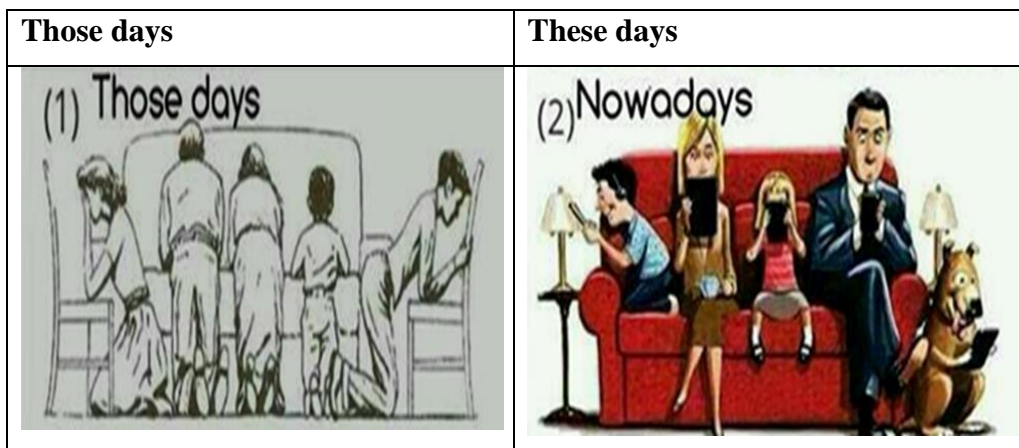
Learning versus transformation

- Are the students becoming the best version of themselves? What is the value addition?
- Are they learning how to make the best use of what they have?
- Do they develop passion for their activities? How many are eager to go the extra mile?
- Dreams without goals are useless. You cannot realize your dream without waking up and being disciplined, consistent and committed to your goal.
- Hard work works.
- Do not confuse movement with progress.

Teachers' perception of learners

- Do our teachers really understand who they are dealing with?
- Are we overwhelmed by the pressure to improve the mean score?
- What is the most important thing we teach our students?
- To what extent do we make them more human?
- Do we think of life after school?
- To what extent do we enable them to be what God created them to be? Do we teach them to play big?

Social Transformation



Research & Innovation

- Why Research and Innovation?
- Who is carrying out Research?
- Who is inventing new knowledge?
- What is the role of our universities?
- Where is the solution for e.g Corona Virus?

We need to go beyond the existing knowledge and create new knowledge to make a difference.

Sustainable development is development that meets needs of present without compromising the ability of future generations to meet their own needs.

Kemi Establishing ESD Model Centres Across the Country



SDG1: End poverty in all its forms everywhere

How far are we?

SURROUND YOURSELF WITH



**THOSE ON THE SAME
MISSION AS YOU**

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

Global Citizenship Education (GCE)

- A form of civic learning that involves students' active participation in projects that address global issues of a social, political, economic, or environmental nature.
- The two main elements of GCE are Global consciousness; the moral or ethical aspect of global issues, and global competencies, or skills meant to enable learners to participate in changing and developing the world.
- GCE addresses themes such as peace and human rights, intercultural understanding, citizenship education, respect for diversity and tolerance, and inclusiveness.
- GCE provides the overall lens which views the role of education in the promotion of the rule of law.
- It draws upon experience from other education processes, including human rights education, peace education, education for sustainable development, education for international and intercultural understanding.
- GCE aims to empower learners to engage and assume active roles, both locally and globally, as proactive contributors to a more just, peaceful, tolerant, inclusive, secure and sustainable world.

- GCE aspires to be a transformative experience, to give learners the opportunities and competencies to realize their rights and obligations to promote a better world and future.
- GCE is built on a lifelong learning perspective. It is not only for children and youth but also for adults. It can be delivered in formal, non-formal and informal settings. For this reason, GCE is part and parcel of the SDG4, Target 4.7.

Competencies

While GCE can take different forms, it has some common elements, which include fostering in learners the following competences:

- An attitude supported by an understanding of multiple levels of identity, and the potential for a collective identity that transcends individual cultural, religious, ethnic or other differences (such as a sense of belonging to common humanity, and respect for diversity);
- A deep knowledge of global issues and universal values such as justice, equality, dignity and respect (such as understanding of the process of globalization, interdependence/ interconnectedness, the global challenges which cannot be adequately or uniquely addressed by nation states, sustainability as the main concept of the future)
- Cognitive skills to think critically, systemically and creatively, including adopting a multi-perspective approach that recognizes different dimensions, perspectives and angles of issues (such as reasoning and problem-solving skills supported by a multi-perspective approach);
- Non-cognitive skills, including social skills such as empathy and conflict resolution, and communication skills and aptitudes for networking and interacting with people of different backgrounds, origins, cultures and perspectives (such as global empathy, sense of solidarity); and

- Behavioural capacities to act collaboratively and responsibly to find global solutions to global challenges, and to strive for collective good.

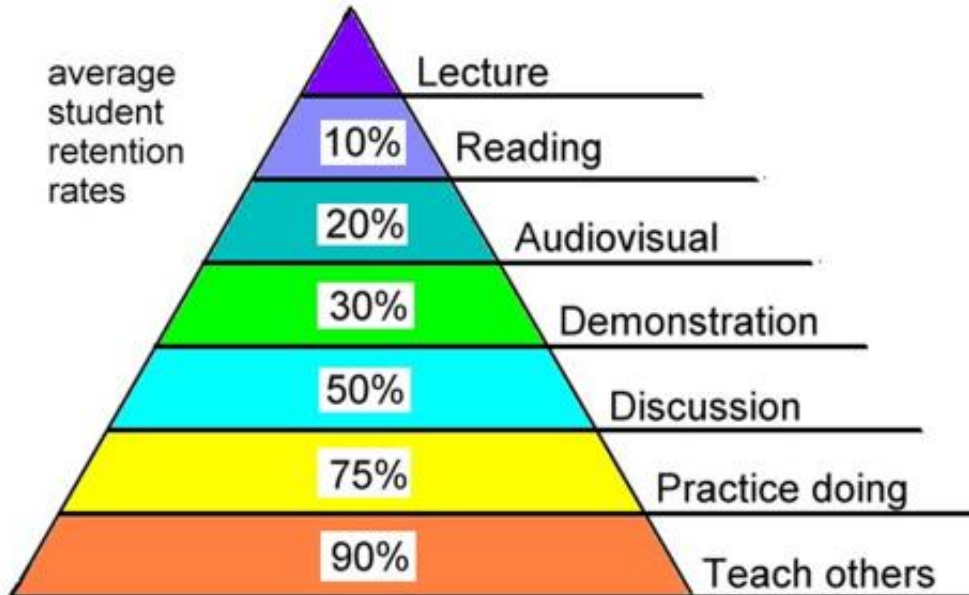


How children learn:

Multiple intelligences

- Linguistic, visual spatial (drawing and painting).
- Logical mathematical Intelligence
- Body or kinaesthetic (athletes and footballers).
- Musical intelligence (through songs and poems).
- Inter-personal intelligence (groups).
- Intrapersonal (work individually).
- Emotional intelligence
- Spiritual intelligence
- Moral intelligence
- Naturalistic Intelligence
- Intellectual Intelligence

Learning Pyramid

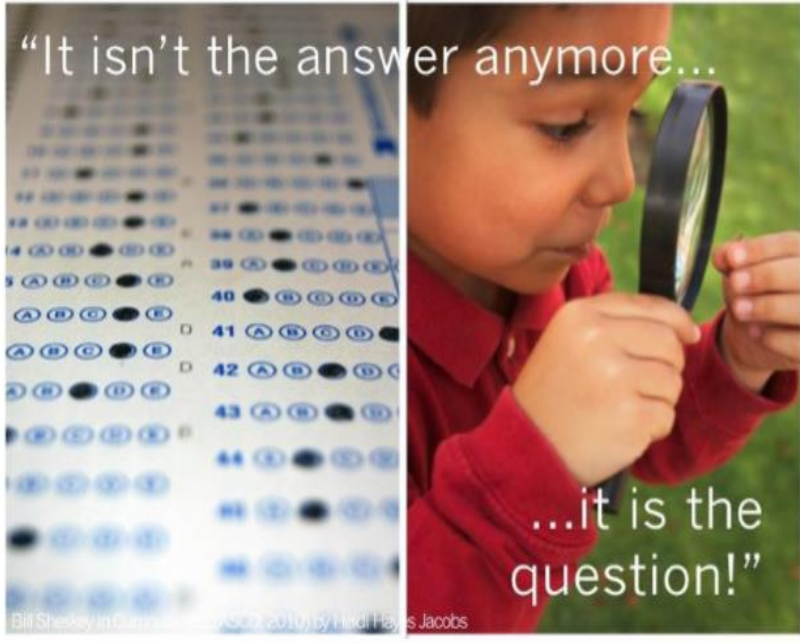


Source: National Training Laboratories, Bethel, Maine

Practical Learning



From answer to question.....



Dive Into Inquiry Trevor Mackenzie

Goals for today:

- ✓ Think **BIG**
- ✓ Start small
- ✓ Think of your learners
- ✓ Relationships first

Ken Robinson: "What is a global citizen?"

empathy, compassion, understanding, patience

Tell your students that you believe in them

Ask student: "How can you improve?"

TEACHER CENTERED → STUDENT CENTERED

Structured → Controlled → Guided → Free

Driving question guides the unit

? NOT the answers

Turn BREADTH into DEPTH

Students know their voice matters

Assess reflections ie. on buddy project

Inquiry classroom: "Why is this important to you?"

"Will I be ready for university?"

"If students designed their own schools"

The Risks vs The Pros of Inquiry → Ask students after watching video

@sylvia duckworth

TARGET 4.1

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

Education for Sustainable Development

Education for Sustainable Development (ESD) is a broad and evolving concept that can be broadly interpreted as holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment to achieve societal transformation.

The purpose of the ESD

To enable each child or young person to be:

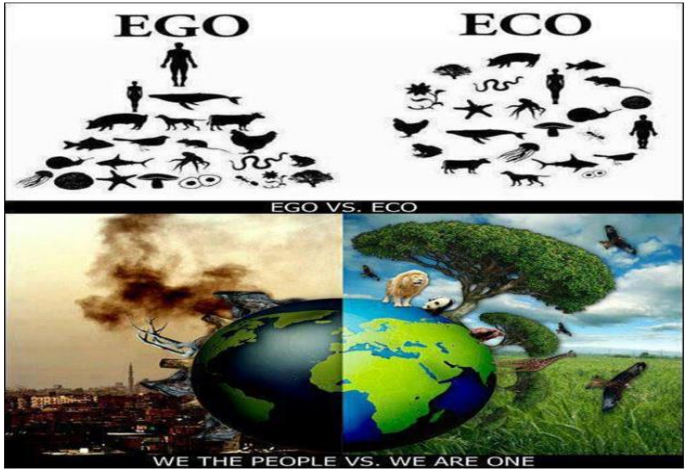
- a successful learner
- a confident individual
- a responsible citizen and
- an effective contributor to development

Where shall we start?

The Greatest distance on Earth is the 30 cm (14 inch) between the head and the heart



Peace Makers: The 13 Grandmothers Council



Principles of ESD

- Learning to know
- Learning to be
- Learning to live together
- Learning to do
- Learning to transform oneself and society

The Three Spheres of Sustainability

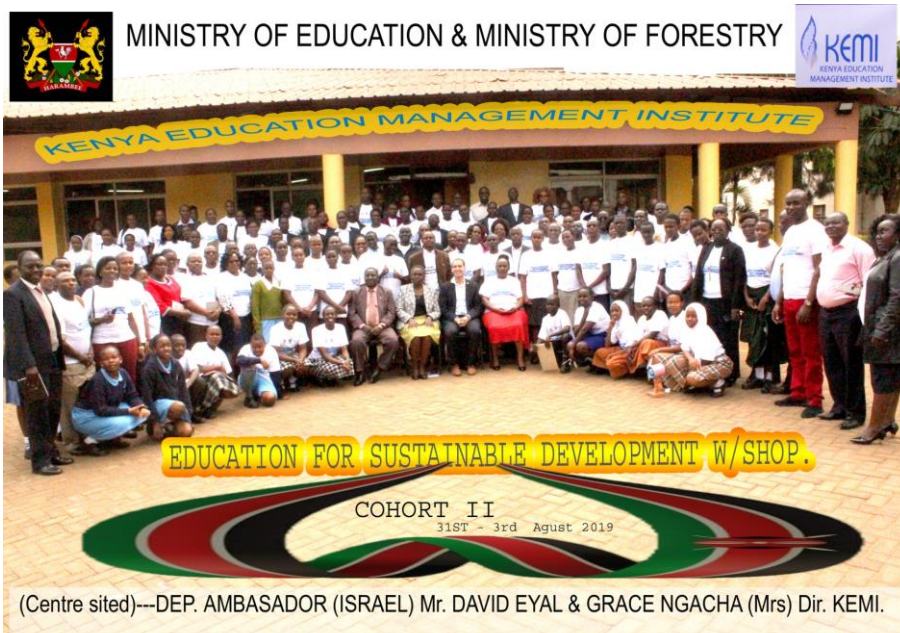


Are Workshops Adequate Enough?

Why are we looking for networks?

How to Succeed: Stakeholders' Involvement

Just Touch the Soil



(Centre sited)--DEP. AMBASSADOR (ISRAEL) Mr. DAVID EYAL & GRACE NGACHA (Mrs) Dir. KEMI.

HOW TO BEGIN

Ensure that:

- ❖ Learning happens
- ❖ Transformation is evident
- ❖ Actions speak louder than words

Start with simple targets to make a difference in the institution

Learner Centered Learning



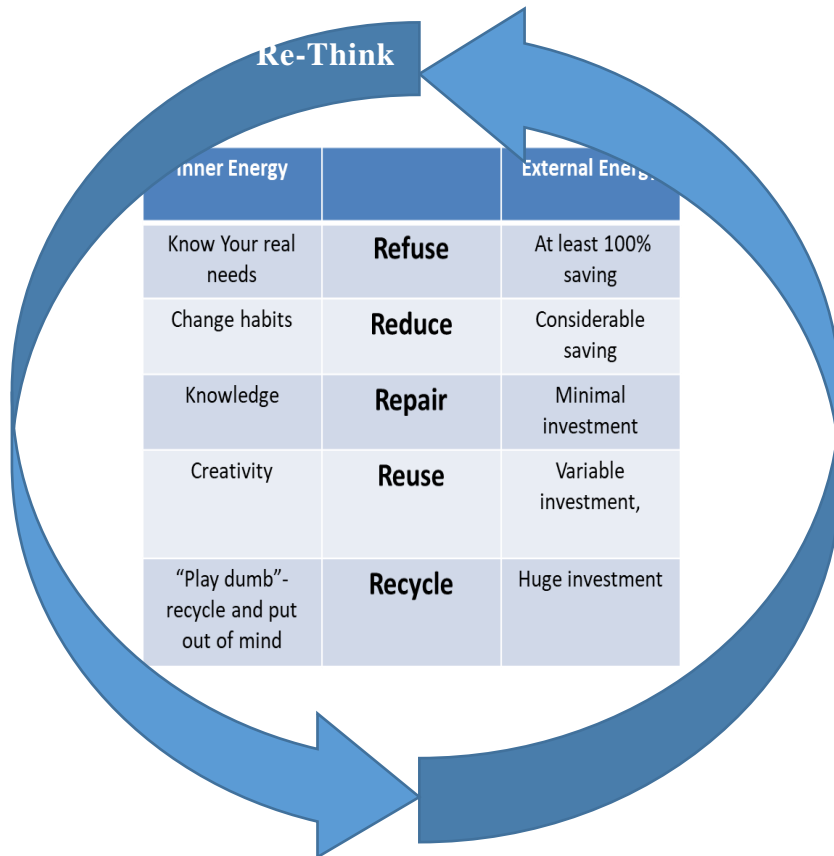
SDG 2: Zero Hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

SDG 3: Good Health and Well-Being

Ensure healthy lives and promote well-being for all at all ages

The 7 golden rules for sustainable living



Tower Garden



Re-Use Waste



Some Responses from ESD Model Schools

- Students have gained practical skills on farming and entrepreneurship;
- Improved student discipline due to being engaged effectively;
- Enhanced collaboration among and between learners and staff
- Income generation for the school to cut on costs
- Improved student retention at school
- Cost-cutting on the school in terms of sourcing resources for Biology and Agriculture practical classes
- Excitement for work; learners are self-driven
- Integration of ESD activities in different learning area such as Mathematics, Physics, English, Art, Biology etc.
- Exploration and deeper learning through research by learners
- Improved teacher preparation for classroom delivery
- Enhanced creativity, problem solving and innovation

Harvesting fish from a school's pond: Lion's High school in Kisumu



Learning through Work



Poultry farming at Meru Polytechnic: Over 10,000 hens reared by students



Modern farming: Using waste bags and sacks



Use of available space: On trees



Herbal garden at Karura Forest Primary School-Nairobi



Establishing Tree Nursery Beds



Learning to Learn: explore, experience and experiment



Students constructing a simple poultry hatch; Kirimari High, Embu



Do not deny them opportunities to learn



Talking Paths to inculcate Value



Repair land: reclaim and use. Reclaimed land at Kiambu High School





4(a): Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

**Alternative Method of paying fees for learners to be retained in school;
Garsen High School; Tana River**



Community Service Learning



Learners happily planting fruit trees



Nakuru High School students preparing a seed bed



Garissa High School Students Planting Fruit Trees



Pyramid Garden, Kiptilit Primary School, Baringo



What Solution can you offer?

SDG 5: Achieve gender equality and empower all women and girls

Breaking cultural barriers as part of learning; Kivaywa Boys in Kakamega & Kirimari Boys in Embu



Cooperate Social Responsibility (CSR)



Pig farming, Baricho Boys, Kirinyaga. Cattle rearing, Kaaga Girls, Meru



Modern farming, Greenhouses, KEMI and Nakuru Boys



Weaving, Knitting and Modelling, St Mary's Primary in Nakuru



Let them enjoy



Communication and collaboration skills

Learners with Special Needs not to be left behind, Kitui



4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

Digital Literacy to enhance learning, Machakos Boys' School



Bakery in school cuts costs, Nyeri Complex Primary & Machakos Boys



Reuse of Waste Timber- PEACE CORNER: PCEA B.N, Uasin Gishu



Reuse of waste - PEACE CORNER, Machakos Boys



Repair to avoid wastage, Hospital Hill Primary- Nairobi



Recreation Activities- HHS-Nairobi



Home beautification and gardening using old tyres



Aesthetics, Ikuu Boys in Chuka



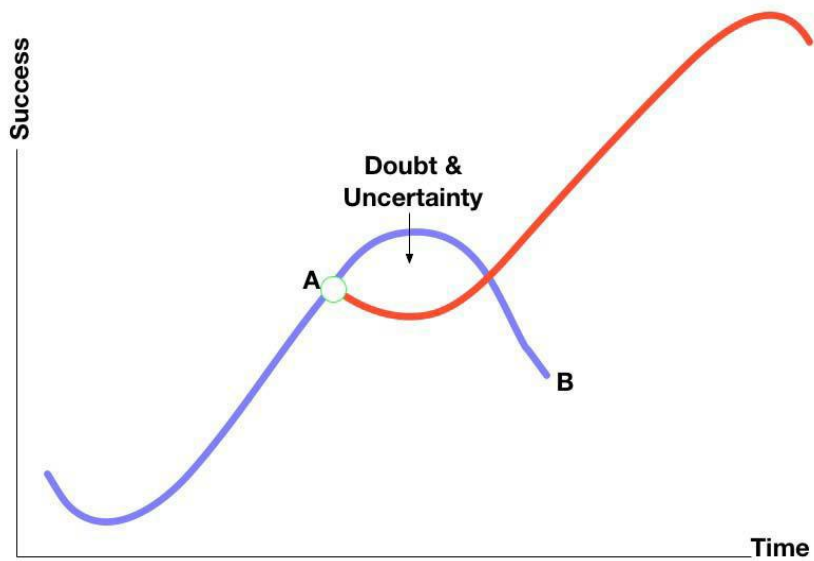
Does ESD then make Sense?

- 1) Teachers as Leaders
- 2) Students as Innovators
- 3) Schools as Centers for ESD
- 4) Citizens as Prosumers



Qualities we all should desire to have:

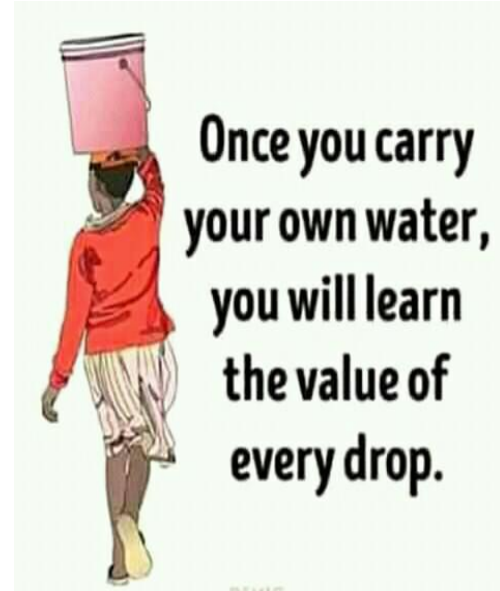
- Long Neck: Concerned about great things
- Tallest in the Jungle
- Small head but very wise
- Good vision: Can see far (Smaller animals heavily use in case of danger)
- Hard kicks (not even the king of the jungle can withstand)
- Walking style is unique: right & left leg together
- Very stable - well spread hooves
- Confident
- Eats the best (thorny leaves)
- Big and strong heart
- Can postpone giving birth
- If it falls, it is difficult to come up
- Newly born stands immediately



SDG 6: Ensure availability and sustainable management of water and sanitation for all

Art of Rain Water Harvesting





SDG 7: Ensure access to affordable, reliable, sustainable and modern energy

Use of clean energy, bio-digesters, as in Nyeri Complex Primary & Ikuu Boys, Chuka



SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Establishing Green walls; Joel Omino Sec. School; Kisumu

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



REFLECTION

How should we lead, manage and ensure research into the brain and processes of learning results in more effective teaching?



SDG 10: Reduce inequality within and among countries
Leaving No-one Behind: **United in our differences**



SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

SDG 12: Ensure sustainable consumption and production patterns

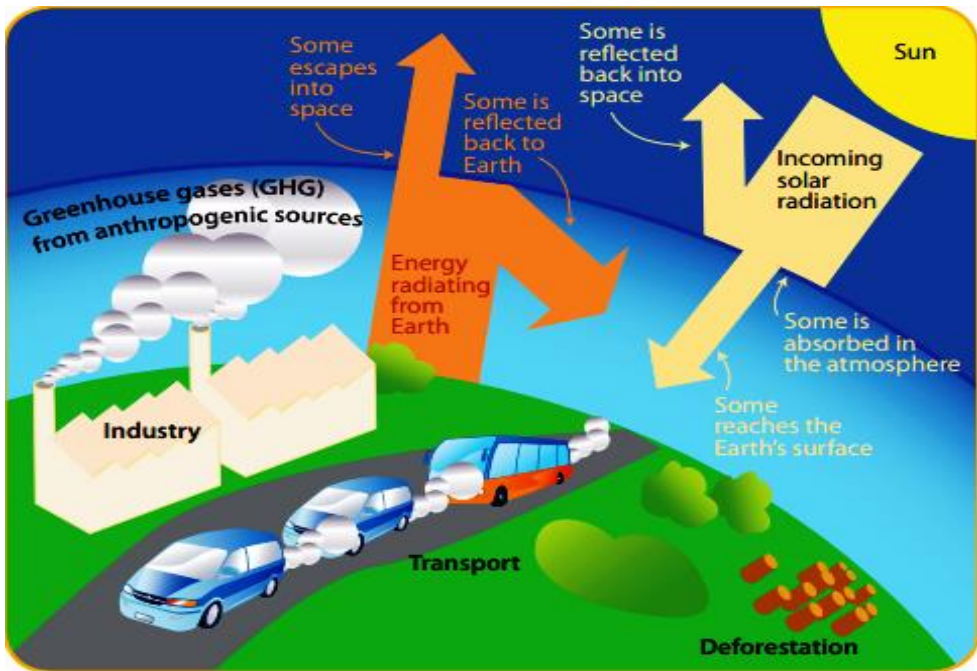
SDG 13: Take urgent action to combat climate change and its impacts*
Participation in Community Service Learning: CLIMATE ACTION - RCEA
Biwott Ngelel High; Uasin Gishu



The value of one single tree.



Climate Change



SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

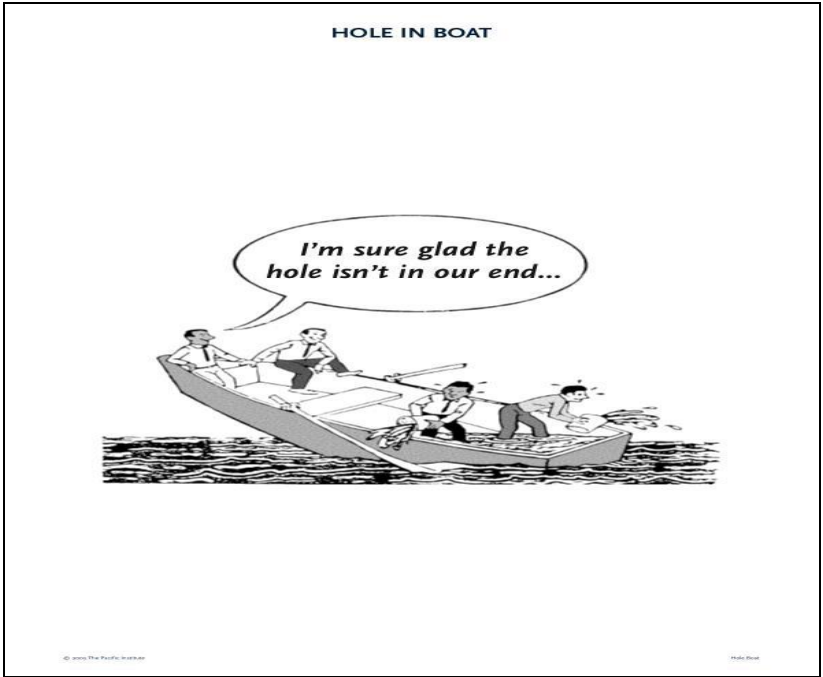


Lions Boys; Kisumu

SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels





SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development



Collaboration

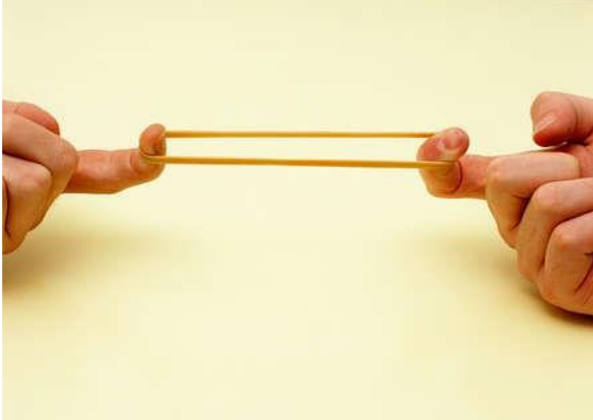
Be the Change



ESD and GCE are sure means of achieving the Sustainable Development Goals (SDGs)

SUSTAINABLE DEVELOPMENT GOALS





Power



Three Simple Rules in Life:

1. If you do not GO after what you want, you'll never get it.
2. If you do not ASK, the answer will always be NO.
3. If you do not step FORWARD, you will always be in the same place.

— UNKNOWN | @PEACEFULMINDPEACEFULLIFE

WHEN YOU FOCUS
ON BEING A
BLESSING,
GOD MAKES SURE
THAT YOU ARE ALWAYS
BLESSED IN
ABUNDANCE.

A Meaningful Life

is not being rich, being popular,
being highly educated or being
perfect.

It Is about being real, being
humble, being strong and being
able to share ourselves and touch
the lives of others.

It Is only then that we could have
a full, happy and contented life.



ROLE OF THE NATIONAL RESEARCH FUND IN DEVELOPMENT OF RESEARCH ENTERPRISES AND INNOVATIVE CAREERS FOR A PROSPEROUS ECONOMY

Presenters: Dr. Jemima Onsare and Dr. David Ngigi – NRF

Contents

- 1) Background – ST&I Governance
- 2) NRF Functions
- 3) NRF Funding programmes
- 4) Funded projects - NRF contribution in supporting prosperous economy
- 5) NRF approach to supporting innovative research
- 6) Up-coming events

Background: ST&I Governance

- Globally it is known Innovations drives economic growth;
- But what fuels innovation? At the heart of it, Research and Development (R&D) spending;
- Significant R&D spending lead to entrepreneurship growth through its positive effect on innovations and productivity;
- Due to competing demands, R&D Investment in Kenya like in many developing countries has been relatively low compared to global levels;
- Recent national R&D survey indicated Kenya is spending about 0.77% GDP for R&D (2019 Survey);
- Un-coordinated research funding mechanisms;
- To address these challenges, review of ST&I governance frame work was necessitated

- One of Strategic key policy issue was to address the challenge of securing adequate and sustainable funding of ST&I components;
- This reforms led to creation of: **NRF, KENIA & NaCoSTI** under the ST&I Act, 2013;
- The establishment of NRF - to provided mechanisms to mobilize and lobby for continued increment in R&D funding;
- In this law, Kenya's commitment is to spend **2%** of **GDP** annually, to accelerate the attainment of Kenyan dream of globally competitive economy by 2030

Mandate

The **National Research Fund (NRF)** as a State Corporation, established under ST&I Act of 2013;

Mandated: To facilitate research for the advancement of Science, Technology and Innovation for national development

- As stipulated in ST&I Act, NRF is expected to constitute 2% of GDP annually:
 - Money allocated by the National Treasury;
 - Donations, Endowments or Grants (*from international development partners, private sector and philanthropists*)

Functions

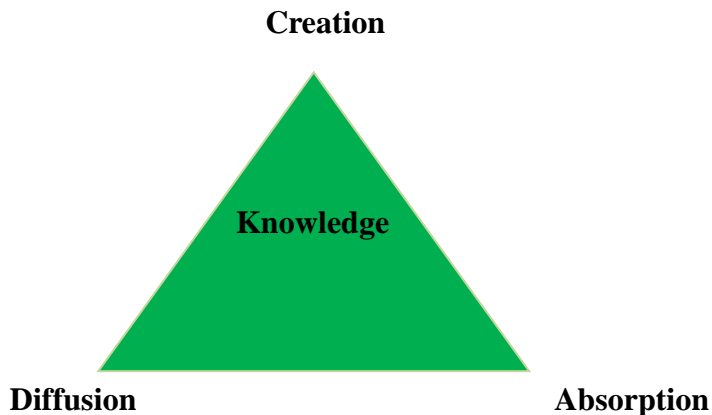
The ST&I Act, 2013 stipulates NRF's functions as:

- To **mobilize resources** for national innovation systems;
- Prudently **manage and invest** the funds mobilized;
- Support the **development of human resources capacity** through grants;
- Support the **development of institutions research capacities** in science, technology and innovation;

- ❑ Facilitate **dissemination** of research findings;
- ❑ **Evaluate** the needs, status and results of funded research

NRF supports creation of a robust National Innovation System

- **Catalytic role**



Funding Programmes

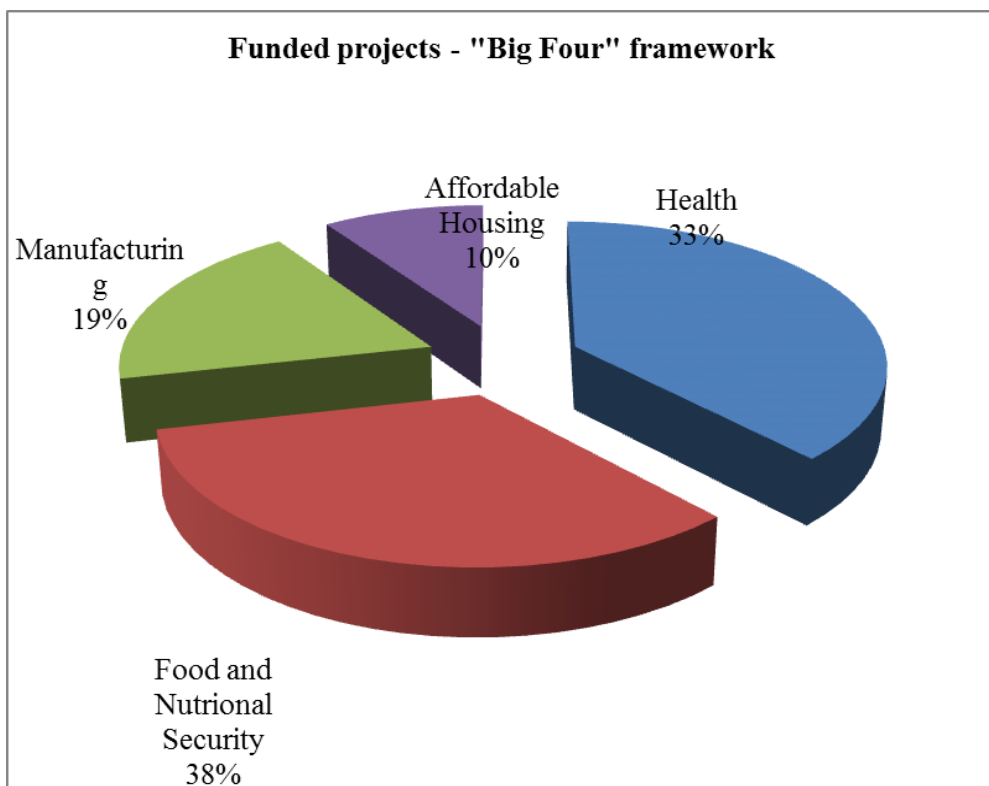
Competitive grants for:

- Postgraduate student research grants
- Multi-disciplinary research grants
- Institution Research Infrastructure grants
- Innovations support grants
- Support for Conferences – Dissemination of research findings
- Bilateral/Multilateral grants
- Kenya/UK (Newton Fund; GCRF)
- Kenya/South Africa joint research
- Kenya/France – Mobility grant
- Kenya/Germany (DAAD) – *PhD Scholarships*

Summary of funded Research Projects (2017-2019)

Investment in Innovative Research/Capacity building		
Programme	No. of funded projects	Amount Awarded for 3 yrs
Multidisciplinary Research	158	1,966,797,445
Doctoral Research	218	272,224,910
Masters Research	198	68,495,032
Infrastructural grants	20	996,015,284
Bilateral projects	50	250,000,000
Total	644	3,553,532,671

Funded projects - "Big Four" framework



Funding Approach: Transformative Research

- Demand rather than supply driven;
- Academia-Industry linkages
- Multi-disciplinary/Multi-institutional;
- Research outputs going beyond publications: (Innovations) products/services for the markets;
- Promoting economic competitiveness through fostering innovations, value addition and entrepreneurship;
- Protecting knowledge production – awareness of intellectual property and regulatory regimes;
- Developing low-cost technologies for local challenges;
- Wide engagement – Stakeholders, end-users

UP-COMING EVENTS

➤ **Kenya-UK Bilateral: - Open Call for GCRF**

All the information about eligibility and how to apply can be found here:

<https://ahrc.ukri.org/funding/apply-for-funding/current-opportunities/gcrf-conflict-intersections/>

- ### ➤ **NRF Strategic Call for Proposals 2019/2020 FY – A Multi-disciplinary, Multi-institutional approach to **Cancer Menace**;**
- ### ➤ **Science Granting Councils Initiatives (SGCI) – Call for proposals seeking to link Academia-Industry (**Up-scaling of innovative technologies**)**

*Utalii House, 9th Floor,
P. O. Box 26036-00100, Nairobi, Kenya
Phone: 020-4403386
Email: secretariat@researchfund.go.ke
Website: www.researchfund.go.ke*

PRESENTATIONS KHAT CHEWING GUM

Presenters: John Kang'rua and Samuel Mbatia

Abstract

This innovation aims on value addition of khat commonly known as Miraa. Khat has commonly be used as a stimulant but taken in the body by chewing the leaves. This comes with disadvantages than advantages. Trying to solve this unsanitary practice with an aim to reduce contamination, increase industrialization and profit realization both at farm and industrial level, job creation and reduce hazards caused by raw khat chewing is the motivation of this product development process. This product is achieved by incorporating the following ingredients; khat, chicle, confectionary sugar and corn syrup.

Introduction

Chewing gum is often chewed to freshen breath and keep the mouth moist. Base ingredient of chewing gum is chicle that is a natural gum from sap of sapodilla tree that is taken under several processing steps to achieve fine gum. Other ingredients are glycerine and vegetable oil to keep the gum from getting too hard, sweeteners like corn syrups and powdered sugar added to give it a sweet taste followed by flavouring. Chewing gum has healthy benefits for teeth, exercising jaw muscles and also improving breath.

Khat is a flowering plant native in the horn of Africa and Arabic Peninsula. It contains an alkaloid cathinone, a stimulant which is said to cause excitement, loss of appetite and euphoria. The stimulating effect of the plant was originally attributed to cathine, a phenethylpropasnolamine type substance

isolated from the plant. This was found in un-fresh leaves containing cathione, which is not very stable and break down to produce cathine and norephedrine belonging to phenylpropanolamine family. When the leaves dry the potent chemical cathione decomposes within 48 hours leaving behind the mild chemical cathine.

When khat leaves are chewed cathine and cathione are reduced and absorbed through the mucosa membranes of the mouth and the lining of the stomach. Both chemicals cause the body to recycle the neurotransmitter, moves slowly resulting to weakness and insomnia.

Khat chewing gum will have a clear distinction between normal chewing gum. We intend to have it as a controlled product sold in selected outlets which are authorized to prevent it from being used by under age children. This innovation is the first of this kind to have been attempted.

USE OF HONEY AS A PRESERVATIVE IN JAM MADE FROM AVOCADO PULP AND COLOR FROM AVOCADO SEED EXTRACT

Presenters: John Kang'rua and Samuel Mbatia

Abstract

Avocado (*Persea americana*) fruit deteriorates rapidly after harvest. Due to underutilization of avocado fruit in the country, there is a need for developing a product from avocado with a longer shelf life than the fruit itself. Avocado jam is a natural, nutritious and safe and thus, its utilization in formulating a jam will contribute to the current consumer needs for natural healthy products. The incorporation of honey as a preservative boosts the nutritional content of the jam as well as its spread ability while enhancing its health benefits as a natural sweetener. The objective of this innovative product development is to contribute to food and nutrition security in Kenya by adding value to avocados through preparation of a jam preserved with honey. The innovation also focuses on colour addition to the jam using avocado seed extract.

Introduction

Jams are usually made from pulp and juice of one fruit other than combination of several fruits. They are prepared by cutting fruits into small pieces and then crushing them into a thick consistency. Good jam has a soft even consistency without distinct juices of fruits, are bright in colour, have a good fruit flavour and a semi jellied texture that is easy to spread but has no free liquid (Berolzheimer at al., 1959).

Avocado is a large usually yellowish –green or black pulpy fruit of *Persea americana* tree. It is classified as a fruit that is rich in fat and vitamin E. (Storey. 1973). The avocado has twice as much energy as banana. In addition, it is rich in vitamin A, B, and C. The fresh buttery pulp is eaten and is the most nutritious part. There are many ways of preparing avocado, the most common being guacamole and sauce.

Honey is a natural sweet substance, produced by *Apis mellifera* bees from the nectar of plants or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in the honeycombs to ripen and mature (Codex Alimentarius, 2001). It is used as a food for human that is, a useful source of high-carbohydrate and usually contains a rich diversity of minor constituents (proteins, minerals, vitamins and others) adding nutritional variety to human diet. It is widely used as a source of sugar for making honey wines and beers and in the manufacture of many secondary products; breakfast cereals, bakery foods and a multitude of other value-added products. Fully submerged product remains free from spoilage and is also delicious.

Colour plays a very vital role in determining the perception and acceptance of food by customers. The colour seen in most processed food is either natural or artificial. Colour is interrelated with flavour intensity, sweetness and salinity sensation and may also indicate the safety of the food. Recently many consumers have increasingly begun to consider synthetic colorants undesirable and consequently, there has been increasing effort to discover new natural alternatives. The avocado seed account for about 16 % by weight of total fruit and is not a well utilized resource. Avocado seed has more

antioxidant and polyphenol activity than the pulp and possess many classes of natural phytochemical such as phytosterols triterpenes, fatty acids, formic acid, abscisic acid and polyphenols. Thus, the need to incorporate the food colorant in our product

Statement of the Problem

Avocado has good nutritional profile and is used in the processing of many food products. However, its wide application in making of commercial jams is limited mainly due to its short shelf life. Use of artificial preservatives to improve the keeping quality of an avocado jam would not be an appropriate option given the many disadvantages that are associated with artificial preservatives such as causing cancer and reduced immunity. Thus, this project seeks to explore suitable natural preservatives for use in jam prepared from avocados.

UTILIZATION AND VALUE ADDITION IN BANANA INFLORESCENCE AS A VEGETABLE TO ENHANCE FOOD AND NUTRITIONAL SECURITY

Presenter: Felister Kemunto Mbaka

Introduction

Banana inflorescence is a complex structure that includes the flowers that will develop into fruits. Banana inflorescences are widely consumed as vegetables popular in Indian. Both the inflorescence covers and flowers can be cooked together or separate depending on the consumer's preference. Banana inflorescence has outstanding medicinal properties and potent nutritional profile. Medicinal properties include; treatment of infections, slows the aging process, promotes heart health, improves digestion and regulates blood sugar. Banana flower is packed with essential minerals such as phosphorous, calcium, potassium, vitamin, copper, magnesium and iron which are vital for several bodily functions. Energy 51 kg cal, Protein 1.6 g, Fat 0.6 g, Carbohydrate 9.9 g, fibre, 5.7 g, calcium 56 mg, Phosphorous 73.3 mg, iron, 56.4 mg, vitamin E, 1.07 mg (According to the African Journal of Biotechnology).

Statement of the Problem

In Kenya after harvesting the banana bunches the inflorescences are discarded in the farms or used as jerry can covers in some communities. Despite its nutritional composition utilization of banana inflorescences as a vegetable in Kenyan communities has not been practised. This is because of lack of information by farmers on the nutritional compositions of the inflorescence Utilization of banana inflorescence will greatly help to

alleviate the problems of malnutrition thus promoting food nutritional and food security in different communities. Therefore, there is need to promote awareness of banana utilization as vegetable. This work seeks to determine the nutritional composition of inflorescence of Kenyan banana varieties (Plantain) and to devise ways of utilizing it as a vegetable (different products) and processing it to enhance keeping quality.

Procedure for Banana Preparation and Cooking

- Harvest banana inflorescences and remove the black stem from the florets
- Peel the bright purple coloured covers and tender flowers can be cooked together or separate (this depends on one's preference)
- Put them in water mixed with citric acid to avoid loss of Vitamin C (due to oxidation) for 10 minutes
- Rinse and drain the soaked covers or flowers, slice them thinly like lettuce
- Boil for 10-20 minutes
- Prepare other stir fry ingredients like onions, tomatoes, amaranths (this depends on one's preference)
- Fry the boiled banana inflorescences
- Fried inflorescence can be served with ugali, rice, cooked Matoke, chapatti etc

Value Addition of the Banana Inflorescence

Banana inflorescences will be subjected to blanching, and drying to produce dried inflorescences vegetable that one can rehydrate for use and powdered inflorescence vegetable to formulate or to improve other food products



INTEGRATION OF ZAI PIT IN SOIL MOISTURE CONSERVATION, NUTRIENT AVAILABILITY AND IMPROVED CROP YIELDS IN SEMI-ARID AREAS

Presenter: Mbaka Kemunto Felister

Abstract

Low crop yields due to low erratic rainfall, high evapotranspiration, and deteriorating soil fertility in smallholder farmers' fields of sub-Saharan Africa have led to a quest for sustainable production practices with greater resource use efficiency. To alleviate water stress, soil fertility decline and reduce runoff, water harvesting technologies and integrated soil fertility management (ISFM) are alternative promising options whose impact on agricultural productivity are not yet clear. This review paper is therefore aimed to assess the effect of using zai pits in moisture stress management and nutrient availability. Effects of zai pit and conventional cropping techniques combined with integrated soil fertility management (ISFM) in semi-arid areas have shown positive impacts.

Keywords: water stress, soil fertility decline, zai pit, integrated soil fertility management

Introduction

Inadequate water and low nutrient supply have been major constraints in crop productivity in the world (Hengsdijk and Langeveld, 2009). Along with low nutrient status, soil moisture stress is another most critical constraint that has caused decline or stagnation of crop production (Rockstrom *et al.*, 2010). Research indicates that soil nutrient deficiency is often equally limiting to crop growth as water scarcity in semi-arid farming systems (Breman *et al.*,

2001; Fox and Rockstrom, 2003). Water and nutrients thus interact in limiting crop growth. Similarly, Intergovernmental Panel on Climate Change (IPCC, 2007) reports a high level of confidence that agriculture production will be severely affected by climate change Current average global crop yield growth of the world's major cereals varies between 0. % and 1.6% per year, and the rates of increase have fallen in the past two decades (Grafton *et al.*, 2015).

Moreover, high frequency of dry spells and droughts that characterize rainfed agriculture in Africa (Rockstrom *et al.*, 2010) threaten national food demand projected by 2050 (Grafton *et al.*, 2015). Zai pit (also called tassa in Niger or towalen in Mali) is one of the successful interventions that improve precipitation capture, reduce runoff and evaporation, and improve agricultural productivity (Evelt and Tolk, 2009). Farmers who use these technologies are likely to cope with the effects of climate variability and soil degradation such as low yields during severe dry spells.

Statement of the Problem

Majority of the smallholder farmers in Kenya in the Arid and Semi-arid areas depend on crop production and livestock keeping for subsistence. These activities face many constraints due to unreliable rainfall and high rate of evapotranspiration; limit crop growth further reducing yields (Altieri and Koohafkan, 2008). To offset crop failure arising from rainfall variability and unpredictability, some farmers have opted to adopt soil and water harvesting techniques particularly the Zai pits to conserve soil and increase water infiltration as well as replenish soil fertility (Biamah, 2005). But there is need to study the pattern of water movement in the profile in zai-treated plots and also to estimate the potential nutrient losses that can occur under these.

Further research under on-farm, farmer designed and farmer managed trials is needed to assess the economics of the zai pits in combination with integrated nutrient management.

Zai Pit Establishment Steps

Zai pits are dug during the dry season when labour constraints are minimal. Each pit is 20-30cm wide, 10-20 cm deep, with the soil from the pit thrown downhill. The spacing of pits within rows as well as the spacing between rows of pits varies between 60 and 100 cm. At the beginning of the rains 200-600 g of compost are added to the pits (Roose *et al.* 1993). The compost manure is mixed in the bottom of the hole.



Figure 1. Preparation of Zai pit



Figure 2. Zai pit ready for planting

Effects of Zai Pit on Soil Moisture

Water harvesting and storage is vital to ensure water availability for plant growth especially during the dry spells and drought periods in the semi -arid areas. Zai pits increase the amount of water stored in the soil profile by trapping or holding rainwater where it falls (Stott *et al.*, 2001). Water stored in the zai delay the onset and occurrence of severe water stress thereby buffering the crop against damage caused by water deficits during dry periods (Nyamadzawo *et al.*, 2013). In addition, zai captures rainfall and run-off water, increasing water availability to the plant and reducing the negative impacts of erratic rainfall and periodic dry spells (Reij *et al.*, 2009). Besides enhancing water storage, zai pits increases water infiltration and reduces run-off for plant uptake during the dry periods (Dreshel *et al.*, 2005). Zai can collect up to 25% or more of a run-off coming from 5 times its area (Malesu *et al.*, 2006). Zai pits are known to allow crops to regularly succeed in places with high risk of crop failure (Critchley and Gowing, 2012).

Impact of Zai Pit on Yields

Research has shown that the zai technology increases crop yield and straw (residue) production on highly degraded soils and helps to alleviate the adverse effects of dry spells, which are frequent during the cropping period in the dry land areas (Kabore and Reij, 2004; Fatondji *et al.*, 2006). A report by Kabore and Reij (2004) found that zai increased sorghum yields by 310 kg ha⁻¹ compared to the non-zai situation in the village of Donsin, which had adopted this zai pits. In Niger's Illela district, yields in pits were measured on the same farmer-managed fields during a period of 6 years (1991 – 1996). Average cereal yields on untreated fields were 125 kg ha⁻¹ and in pitted fields 513 kg ha⁻¹, with a minimum of 297 kg ha⁻¹ for 1992 and a maximum of 969 kg ha⁻¹ for 1994 (Kaboré and Reij, 2004). Zai pits technology (also known as Tumbukiza) produced significantly higher dry matter yields than conventional method in Western Kenya (Muyekho *et al.*, 2000). In semi-arid areas, a drought can lead to total crop failure but experience from Zambia (Haggblade and Tembo, 2003) shows that, planting basins can improve the possibility of maintaining some production with very low rainfall.



Figure 3. Sorghum grown in Zai pits



Figure 4. Intercropped legumes and sorghum in Zai pits

MATHEMATICAL MIND-BOGGLING PUZZLES

Presenters: Denis Chacha, Kimeu Bernard, Okuku Brian, Teresia Njeri and Deborah Nasieku

Supervisors: Prof. Musundi S.W. & Dr. Dennis Murithi

Mathematics Club

Abstract

Mind-boggling in mathematical puzzles involves both arithmetic and logics in finding their solution or interpreting their situations. Mostly they do not require one to have knowledge in mathematics but reasoning. They can therefore be termed as science of reasoning. They are essential mind opening games with basic arithmetic operations. They are not necessarily true but they contain some truth in them. They are meant to improve one's critical thinking since they are simple but confusing. They make mathematics interesting and something to joke with thus making one eager to know more about mathematics. This makes mathematics fun and enjoyable. In our project we have sampled some of mind-boggling games.

INTRODUCTION

Mind-boggling composes of two main parts; "mind" which means the ability for rational thought of processes in which consciousness perception affecting judgement and which are based.

The other part is' boggle" meaning to be confused or dumbfounded. It is that which requires critical thinking in finding their solutions. Therefore mind-boggling is termed a science of reasoning. Mind-boggling has various important in the field of mathematics and also science of reasoning .It enhances critical thinking ,this helps in sharpening the mind of the participant. They also make mathematics a real subject in the real world situation. Mind-boggling attracts people from other field outside the field of mathematics.in conclusion mind-boggling make mathematic to be more friendly especially in solving problems.

$$\text{Bed} + \text{Bed} + \text{Bed} = 30$$

$$\text{Bed} + \text{Bus} = 40$$

$$\text{Bed} + \text{Bus} + \text{Trophy} = 60$$

$$\text{Trophy} = ?$$

What is the number of triangles?

K K Meena



(A) 18 (B) 16

(C) 20 (D) 22

**Only 2% Students Solved
this Question.**

$$5+3+2 = 151022$$

$$9+2+4 = 183652$$

$$8+6+3 = 482466$$

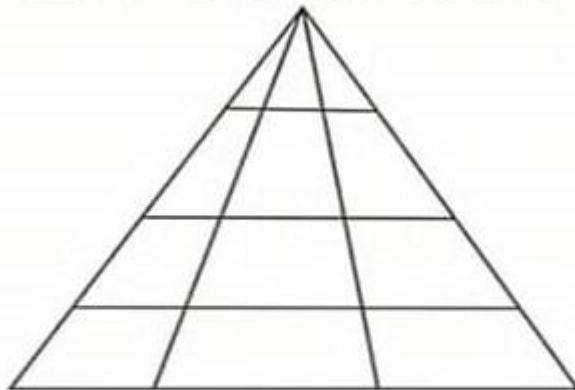
$$5+4+5 = 202541$$

Then...

$$7+2+5 = ????????$$

Reply must & Prove you are GENIUS..!

**90% Will Fail
To Give Correct Answer**



How Many Triangles?

© 2013 David



FOR GENIUSES ONLY

Page fb : Viet funny videos

$$\text{Gears} + \text{Gears} + \text{Gears} = 30$$

$$\text{Gear} + \text{Wheels} + \text{Wheels} = 20$$

$$\text{Wheel} + \text{Sprockets} + \text{Sprockets} = 9$$

$$\text{Wheel} + \text{Sprockets} \times \text{Gear} = ?$$

I Bet **99.99%** Will Fail!

Can You Solve This?

$$\text{Red Flower} + \text{Red Flower} + \text{Red Flower} = 60$$

$$\text{Red Flower} + \text{Blue Flower} + \text{Blue Flower} = 30$$

$$\text{Blue Flower} - \text{Yellow Flower} = 3$$

$$\text{Yellow Flower} + \text{Red Flower} \times \text{Blue Flower} = ?$$

Find the missing number:

2	6	18
4	20	100
?	21	147

Only for Genius...

IF: 1112 = 25

1113 = 36

1114 = 47

1115 = 58

Then: 1117 = ??

$$\frac{\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}}{\sqrt[3]{8}} = ?$$

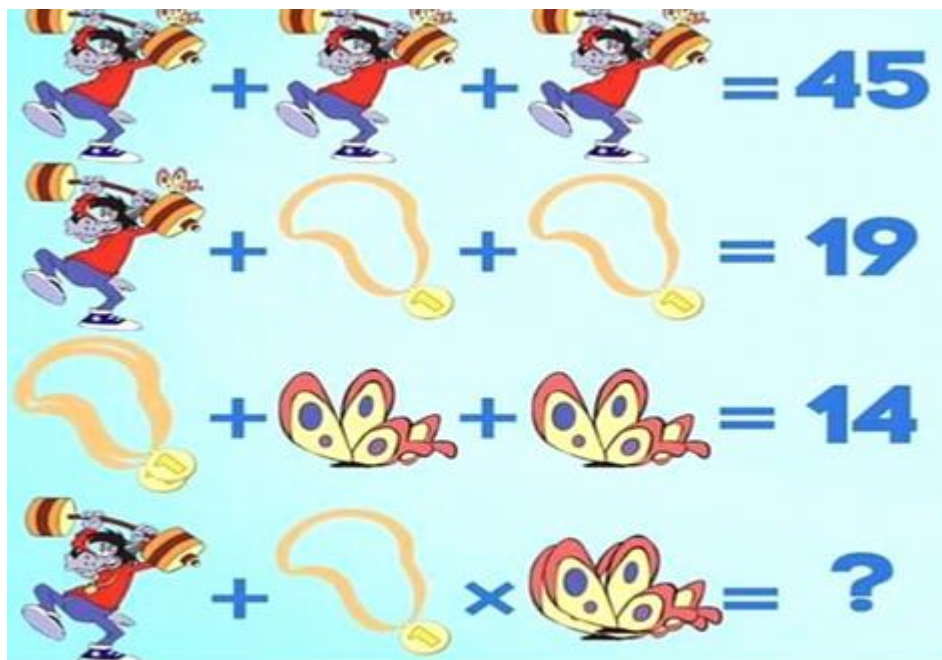
(1) 4

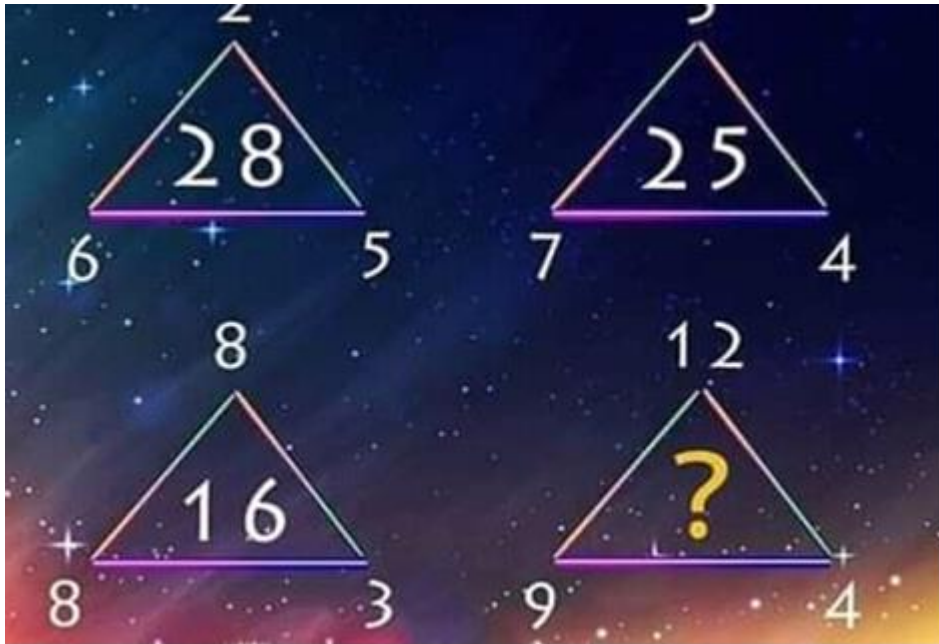
(2) 2

(3) 8


(4) $\frac{1}{2}$

Math Quiz II
Math and Puzzles
Purely Mathematics





Only for Geniuses ;)



If:

- $2 = 6$
- $3 = 12$
- $4 = 20$
- $5 = 30$
- $6 = 42$

Then: $9 = ??$



Find '?'

1	2	3
4	5	6
7	8	9
27	38	?

Only **Geniuses** Can
Solve This



CAN YOU SOLVE THIS? 

 +  +  = 24

 +  +  = 20

 ×  -  = 10

 +  ÷  = ??



[f/PicDownloadz](#) [PicDownloadz.com](#)

РЕШИ ЗАДАЧУ

$$\begin{aligned} \text{shoe} + \text{shoe} + \text{shoe} &= 30 \\ \text{boy} + \text{boy} + \text{shoe} &= 20 \\ \text{ice cream} + \text{ice cream} + \text{boy} &= 13 \\ \text{shoe} + \text{boy} \times \text{ice cream} &= ? \end{aligned}$$

$$\begin{aligned} \text{turtle} + \text{turtle} + \text{turtle} &= 30 \\ \text{turtle} + \text{crab} + \text{crab} &= 20 \\ \text{jellyfish} + \text{crab} &= 25 \\ \text{turtle} + \text{crab} \times \text{jellyfish} &= ? \end{aligned}$$

BrainFans.com



END

TAMARIND FLAVOURED TOFFEE CONTAINING HONEY AS A SWEETENER

Presenter: Raphael Muli

Admission. No.: DB11/28420/16

Introduction

Tamarind is a much underutilized fruit despite having many health benefits, thus my product will help in adding value to the fruit with potential for commercialize. My product will also serve as a functional product, delivering the various bioactive substances in tamarind as well as honey in the same product. During processing I will use honey as the sweetener in place of normal sugar. Honey has high antioxidants thus helpful to human body, moreover honey industry has been constrained by low production and thus through my product it will help promote honey industry and encourage honey farming in the country.

Materials and Requirements

- ✓ 5kg Tamarind Fruit
- ✓ 5kg Honey
- ✓ 1kg Butter Fat
- ✓ ½ kg Powdered Skim milk
- ✓ 200g Salt
- ✓ Stainless steel container and plate
- ✓ Refractometer
- ✓ Stainless steel knife
- ✓ Mixer

Procedure for Making Tamarind Fruit Toffee

Will start by extracting tamarind fruit pulp, strain and thereafter use the amount of juice to calculate the proportion of other ingredients using the standard measures.

500g sugar/400g honey,100g butter fat,50g skim milk powder and 2g salt.

Will take homogenized samples in a stainless steel container and mix well with other ingredients, then heat the mixture till the total soluble solid content reach 80 brix.

Salt will be dissolved in small quantity of water and mixed with above mixture and again heated till total soluble solids reach 82-83 brix.

The heated mass will be smeared with fat. This mass will be allowed to cool and set for two to three hours then slid mass will be cut into cubes 1.5 -2.5 with stainless steel knife.



Micro And Small Enterprises Authority

Presenter: Munoru Edward

Assistant Director Enterprise Development

Embu & Tharaka Nithi Region

Introduction

The Micro and Small Enterprise Authority (MSEA) is a state corporation established by the Micro and Small Enterprise Act No. 55 of 2012. It is domiciled in the Ministry of Industrialization and Enterprise development.

Mandate

Our mandate is to promote and assist in development of Micro and small enterprises.

Functions of micro and small enterprise authority

- i. Facilitate technological development, acquisition and transfer by Micro and Small Enterprises.
- ii. Promote innovation and development of products by Micro and Small Enterprises.
- iii. Mobilize resources for development of the Micro and Small enterprises sector.
- iv. Promote mainstreaming of youth gender and persons with disabilities in all micro and small enterprise sectors.

- v. Coordinate, harmonize and facilitate the integration of various public and private sector activities, programs and development plans relating to micro and small enterprises.
- vi. Promote and facilitate research, product development and patenting in the micro and small enterprises.
- vii. Monitor and evaluate the implementation of existing policies and programs related to or affecting the micro and small enterprises and advice the government on appropriate policies and course of action to be taken.
- viii. Formulate and review policies and programs for Micro and Small Enterprises.

MSEA Strategic Interventions

MSEA operates through association model in implementing the following strategies:

1. Inculcating entrepreneurial culture

- Promote the development of school based entrepreneurship curriculum with focus on current National objectives.
- Promote entrepreneurship as a viable career option for professional engagement and wealth creation.
- Promote mentorship through Identification and documentation of role models and case studies.
- Develop and implement demand driven short courses on entrepreneurship.
- Engage political and religious leaders in advocacy on entrepreneurship promotion.
- Develop media programs on entrepreneurship promotion.

- Reform the culture of dependency syndrome in entrepreneurship where imparted by donor funded programmes.
- Promote and enhance uptake of ICT as a key business tool.
- Sensitize MSE on the importance and uptake of taxation.

2. *Development of comprehensive MSE Data*

- Formalization of Micro and Small Enterprise through the Office of the Registrar of MSEs
- Development of registration guidelines and instruments.
- Sensitization of MSEs on registration guidelines, rules and procedures.
- Registration of MSE Associations and Umbrella organizations.
- Sensitize MSEs to register and/or incorporate their businesses.
- Development and maintenance of a data base for MSE associations and umbrella organizations

3. *Innovation, value addition and marketing*

I. Innovation

- Facilitate the registration and protection of intellectual property, rights for innovations and inventions by micro and small enterprises.
- Promote creativity and innovation in the sector through award schemes.
- Ensure uptake of ICT as integral framework for MSE development
- Linkages with relevant institutions and Industries to enhance graduation of MSEs through:
 - *Product design and development,*
 - *Access to specialized equipment,*
 - *Linkages of innovations with business angels and venture capitalists.*

II. Value addition

- Facilitate specialization and mass production of farm based raw materials e.g. Cotton, pyrethrum, flowers, etc.
- Promote product design, development and packaging for improved access to market opportunities.
- Facilitate research on product design and development for MSE products and services.
- Promote value addition and support value chain in the four subsectors in the MSE sector – agribusiness, trade, manufacturing and service
- Facilitate technology development, acquisition and transfer by Micro and Small Enterprises.

III. Marketing

- Develop strategies to promote marketing of MSE products and carry out assessment to identify MSE marketing needs.
- Establish mega MSE trade centres at the Airports.
- Coordinate, harmonize and facilitate the County.
- Governments to establish permanent markets in suitable areas.
- Facilitate MSE business linkages e.g. sub-contracting, franchising, arrangements among MSEs and large enterprises (For example MSEs making bolts for the standard gauge railway).
- Facilitate, coordinate and organize International, National and County marketing activities (exhibitions, ASK Trade Fairs)
- Facilitate MSEs to access government procurement.

4. Development of MSE incubation clusters

- Zone out suitable MSEs parcels of land and acquire land title documents

- Formalize documentation of existing Four Hundred Thirty-Seven (437) parcels of land set aside for MSE activities in Kenya.
- Repossess any grabbed MSE land and lobby Counties for additional parcels of land for development of MSEs.
- Coordinate development of markets, sheds, and workshops for MSEs.
- Complete, equip and operationalize 158 Constituency Industrial Development Centres (CIDCs) to enhance incubation.
- Establish Forty-Seven (47) MSE Centres of Excellence, one in each County, for modern technology adoption, transfer, and commercialization and provide centralized common user facilities.
- Develop and implement sector specific MSE Incubation and capacity building programs to enhance MSE graduation.
- Enhance productivity and safety at MSE work places.

5. MSE development fund

MSEA will mobilize resources for MSE development through:

- Grants as appropriated by the government of Kenya.
- Grants, loans or donations from development partners.
- Interests, dividends accruing from investments of surplus funds
- Charges on services rendered by MSEA Funds

Utilization of the Fund

- The MSE fund will provide affordable and accessible credit to Micro and small Enterprises.
- Finance the promotion and development of Micro and Small Enterprises
- Provide technical assistance in the development of products

- Identify markets for MSE products and provide linkages to potential markets.
- Organize trade fairs and shows for MSE products.
- Act as a guarantor for MSEs in accessing credit from financial institutions.
- Finance capacity building for Micro and Small Enterprises.
- Entrepreneurial training
- Skills upgrading
- Incubation
- Finance research, development, innovation & technology transfer
- Identify markets for MSE products and provide linkages to potential markets.
- Organize trade fairs and shows for MSE products.

6. Support to youth programs

The Government of Kenya has received financing from the International Development Association (IDA) to finance the Kenya Youth Employment and Opportunities Project (KYEOP). The project aims at increasing employment and earning opportunities for targeted youths by providing training, business financing and relevant labour market information.

Implementing agencies;

- i. National Industrial Training Authority (NITA)-Training-provision of Skills MSEA-Support to Job Creation-Finances and BDS (targets 38,000 youth)-Component 2
- ii. Ministry of Labour-Providing Market labour information
- iii. Ministry of Public Service, Youth and Gender Affairs (MPYG)-support to Youth policy development and project management

MSEA-Component 2-Objectives

1. To provide seed funding for youth led start-ups
2. To increase access to Business Development Services (BDS) for young self-employed entrepreneurs
3. To support innovative interventions to create jobs for targeted youths (BPC-MbeleNaBiz)
4. To expand economic opportunities to youth who are hard to serve

MSEA-Component 2-Achievements

**** Grants to youths***

To date a total of 7,303 youths in 13 counties have been issued with Ksh 209,340,000 (USD 2,093,400)

****Business development Services (BDS) to youths***

A total of 534 youths in Cycle 2 and 1185 in cycle 3 have been trained; Total is 1719 youths.

**** Business Proposal Competition (BPC)***

- 11737 applications have been received on BPC
- (750 businesses will be supported whereby the first 250 will be financed to the tune of 3.6 m and 500 will get Kshs. 900,000).

**** M &E -Follow up done.***

Cycle1: 664(64%)

Cycle 2: 1744(70%)

Cycle 3: 4067 (75%) of youth beneficiaries

Conclusion

From the above background, I therefore request for an opportunity to present to the participants in details what the Authority has to offer to support MSEs across sectors which include Agri-business, service, trade and manufacturing.

IMPROVING QUALITY OF CLINICAL CODING BY TRAINING HEALTH RECORDS AND INFORMATION OFFICERS IN SELECTED NAIROBI CITY COUNTY HOSPITALS, KENYA

Presenters: J.G. Kiongo, G.O. Otieno, A. Yitambe

Abstract

Clinical coding quality is increasingly becoming an important arm in health and statistics. The objective of this research was to establish whether training could improve the quality of clinical coding in Nairobi City County Hospitals. A before-and-after interventional design was used for the study. The study was conducted at Mbagathi County Referral Hospital and Mama Lucy Kibaki Hospital, with the latter acting as the control group. The study took the form of a baseline and two follow-up studies. The intervention was training on ICD-10. A sample of 612 subjects with 306 cases from each hospital was audited. Pretesting was conducted at Mama Lucy Kibaki Hospital. Data analysis was done using Statistical Package for Social Science (SPSS) Version 25. Fisher's Exact and Paired T- test were conducted to establish the significance of differences between the two groups. The study revealed a low proportional (52%) of files were coded in MCRH than in MLKH (62%) therefore, biasing the intervention to MCRH. The mean for MLKH was 3.63 ± 0.916 compared to 3.56 ± 0.726 for MCRH. The mean difference of on how to use of ICD-10 was 0.25. The mean speed of coding was better in MCRH (4.00 ± 1.000) than in MLKH (3.13 ± 1.458). Coding of cause of death was wanting in MCRH (4.00 ± 1.453) than in MLKH (4.13 ± 0.35). Completeness also varied across. The difference in coding of external injury files between MLKH and MCRH prior to and after intervention was explicit. Coding of external injury files in the intervention

arm improved to 100% from 97.3%. While that of control arm enhanced from 50% to 83.3%. The fisher exact p value was <0.001 before intervention but reduced 0.018 post intervention. Coding for medical procedure files was much less complete before training at 33.3% in MLKH and 93.3% in MCRH. However, coding changed to 83.3% and 100% correspondingly after the training. The Fisher Exact p-value for coding of medical procedures was <0.001 prior to training and 0.001 after training. Accuracy in assigning the appropriate code for diseases and injuries significantly varied after training ($p=<0.001$) contrary to indifferent ($p=0.665$) before training. However, the difference before ($p<0.001$) and after the intervention ($p<0.001$) in assigning the appropriate code for medical procedure was evident. Accuracy in assigning the appropriate code for death certification also varied significantly before ($p=0.009$) and after the intervention ($p<0.001$). The study revealed mean difference after the training. T- Test was statistically significant in death certification ($t = -12.283$; $df = 38$; $p= 0.000$), assigning the appropriate code for medical procedure ($t = -6.969$; $df = 42$; $p= 0.000$) and assigning the appropriate code for external causes of injuries ($t = -4.953$; $df =73$; $p= 0.000$). Appropriate code for comorbidities was ($t = -7.473$; $df=78$), $p= 0.000$), correct code for diseases and injuries ($t = -5.015$; $df = 226$; $p = 0.000$). The study findings support the hypothesis that training of health records and information officers significantly improved the quality of clinical coding. Based on the results, coding was influenced by both coder awareness level, keenness in documentation and interpretation. The study revealed the importance of adequate training, planning and awareness as key ingredients to effective implementation of ICD-10. Enhanced training improves documentation, which in turn enables providers to analyze patient details, thereby leading to better care coordination and health outcomes. The

study recommends greater investment in staff through ICD-10 training and recruitment as well as IT systems across all hospitals within the county.

Introduction

- International Classification of Diseases (ICD) – 10 is a standard coding tool in Biomedical Sciences (WHO, 2015)
- Clinical coding in Kenya based on ICD-10
- The use of codes enhances standardization and comparability.

Statement of the Problem

- Consistency in clinical classification of diseases and medical procedures is huge challenge in the health sector (Lobbestael et al, 2011).
- The quality of clinical coding in Kenya's health facilities is 33%, which is below the WHO standards (Gichuhi, 2015)
- Accuracy and completeness level, as well as the timeliness of coding are undocumented (Gichuhi, 2015)

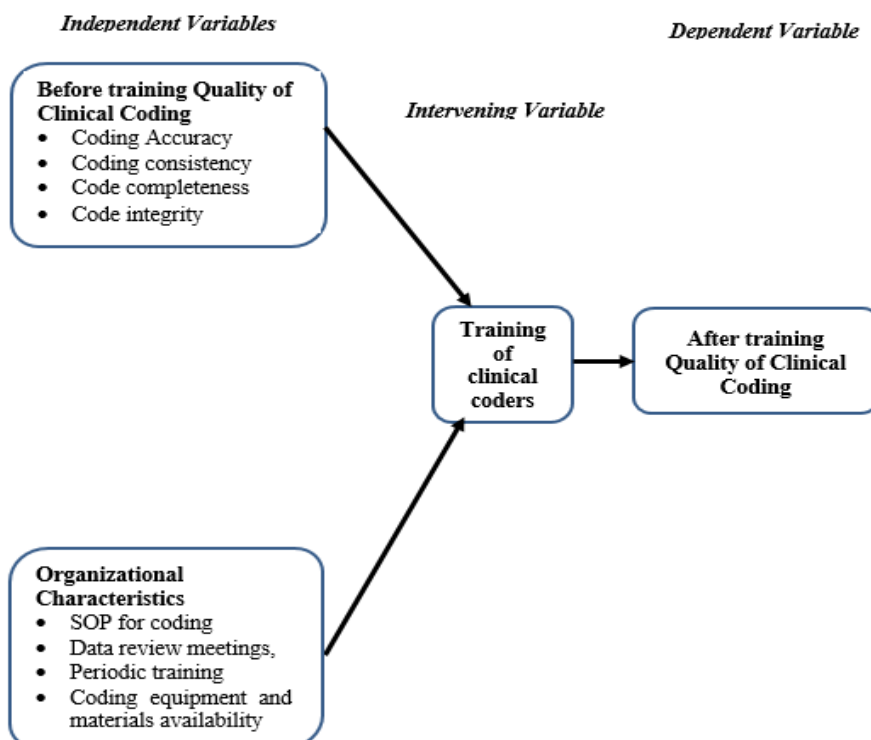
Justification

- The effectiveness and success of implantation of the ICD and ICD codes is crowned in training (Lobbestael et al., 2011)
- However, documentation on the effect on tailored training in quality of clinical coding are scarce (WHO, 2015)
- The study provides a fine base for establishment of the effect on training on quality of coding as well as ways of improving health records and reporting and training in ICD.
- The study provides information useful for the bodies like NHIF, to be more objective in the reimbursement of funds.

Specific Objectives

- To determine the competencies of clinical coding of HR&IO in Nairobi City County Hospitals.
- To describe the level of completeness of clinical coding before and after training of HR&IO
- To compare the accuracy of clinical coding before and after training of HR&IO
- To compare the quality of clinical coding before and after training of HR&IO
- **Null Hypothesis:** Training of HR&IO does not improve quality of clinical coding in selected Nairobi City County Hospitals, Kenya.

Conceptual Framework



Materials and Methods

Research Design

This was a before-and-after study design with quantitative approach.

Variables

- **Dependent:** Post Training Quality of Clinical Coding measured using a composite index based on a checklist
- **Independent:** Pre-training quality of clinical coding, Training, and institutional characteristics.

Location

- Mama Lucy Kibaki Hospital and Mbagathi Sub County Hospital

Study Population

- Health Records and Information Officers
- Discharged patient-cases

Inclusion criteria

- All Health Records and Information Officers
- All patients discharged from hospital

Exclusion criteria

- Health Records and Information Officers who may be away during the study and any that may decline to participate
- Patient discharged following a readmission of the same

Sampling technique – Stratified sampling followed by randomization to select individual case files

Sample Size: $n = \{(z^2 \times N \times p(1-p)) / \{(d^2 \times N) + (z^2 \times p(1-p))\} = 306$

(including 10% attrition rate adjustment), where:

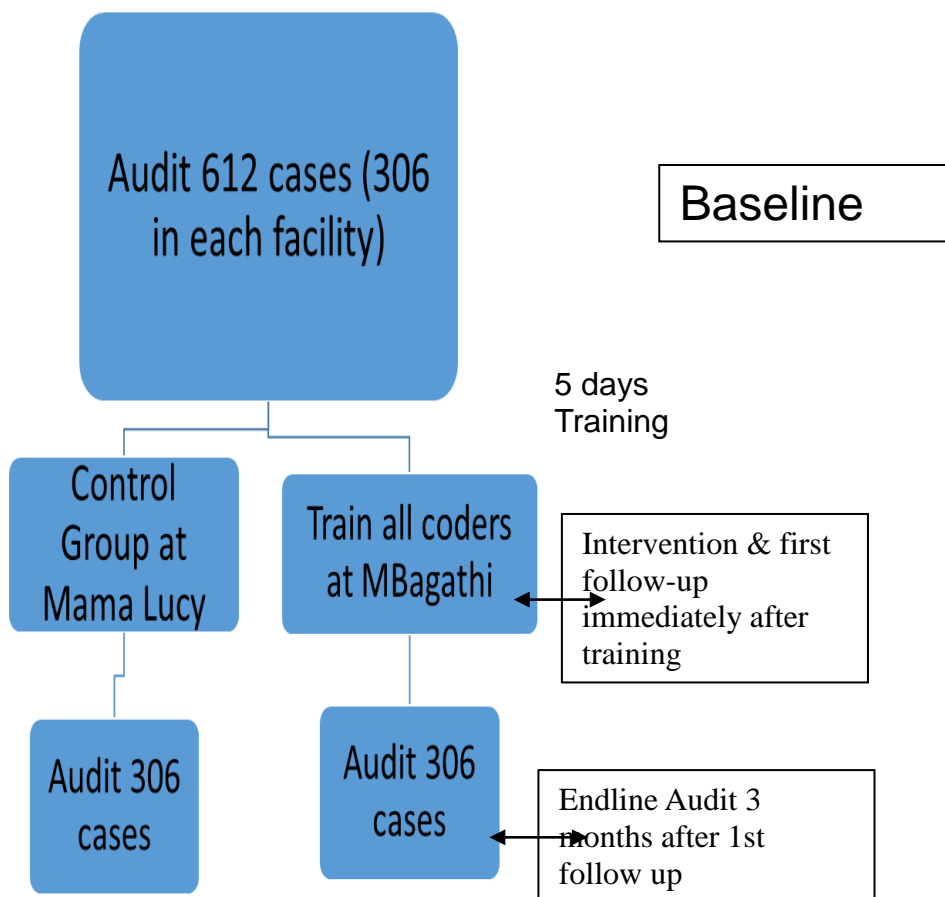
n = number of cases for audit required;

N = Number of patients discharged per month;

p = proportion of the coded files meeting the standard criteria;

z = confidence interval set at 95% interval ($z=1.96$);

d = level of accuracy for 95% confidence interval ($d = 0.05$)



Auditing Criteria

Competencies

- Disease/procedure reporting

- ICD-10 Disease coding
- ICD-10 Co-Morbidity coding
- ICD-10 External causes of injury coding
- Coding of procedures in medicine using ICPM
- ICD-10 Coding of causes of death/death certification

Data Analysis

- A composite index to assess quality of coding was generated from the auditing criteria
- The index was compared between the two facilities both at baseline and in the follow-up
- The influence of independent factors was also analyzed
- Data was analyzed using SPSS version 25 and hypothesis testing done at p-value cut-off of 0.05.
- Quality of coding was measured using paired T-test

RESULTS : DEMOGRAPHIC CHARACTERISTIC				
Variables	Values	Health Facility, Frequency (%)		
		MLKH	MCRH	Total
Gender	Male	4 (40)	6 (60)	10 (58.8)
	Female	4 (57.1)	3 (42.9)	7 (41.2)
Years of services in current Hospital	< 1 year	1 (50)	1 (50)	2 (11.8)
	1–5 years	4 (44.4)	5 (55.6)	9 (52.9)
	5 –10 years	1 (33.3)	2 (66.7)	3 (17.6)
	10–15 years	1 (100)	0	1 (5.9)
	>15 years	1 (50)	1 (50)	2 (11.8)
Education	Certificate	0	2 (100)	2 (11.8)

Level	Diploma	2 (28.6)	5 (71.4)	7 (41.2)
	Degree	3 (60)	2 (40)	5 (29.4)
	Masters	3 (100)	0	3 (17.6)
Experience (in HRIM)	Median = 11 (IQR = 4, 20)			
Ever had a short ICD coding training	Yes	6 (50)	6 (50)	12 (70.4)
	No	2 (40)	3 (60)	5 (29.4)

Obj-1: Competencies of clinical coding

Variables	Values	Health Facility, Frequency (%)		
		MLKH	MCRH	General
ICD-10 policy guidelines	Poor	1(12.5%)	1(11.1%)	2 (11.8%)
	Average	2 (25%)	2(22.2%)	4 (23.5)
	Good	4(50%)	6(66.7%)	10 (58.8%)
	Excellent	1(12.5%)	0	1 (5.9%)
	Mean	3.63±0.916	3.56±726	3.59±0795
How to use ICD-10	Average	2(25%)	3(33.3%)	5 (29.4%)
	Good	2(25%)	3(33.3%)	5 (29.4%)
	Excellent	4(25%)	3(33.3%)	7 (41.2%)
	Mean	4.25±0.886	4.00±866	4.12±0.857
Speed of Coding	Very Poor	1(12.5%)	0	1 (5.9%)
	Poor	2(25%)	1(11.1%)	3 (17.6%)
	Average	2(25%)	3(33.3%)	5 (29.4%)

	Good	1(12.5%)	3(33.3%)	4 (23.5%)
	Excellent	2(25%)	2(22.2%)	4 (23.5%)
	Mean	3.13±1.458	4.00±1.000	3.41±1.228
Coding of cause of death	Very Poor	0	1(11.1%)	1 (5.9%)
	Poor	0	1(11.1%)	1 (5.9%)
	Average	2(25%)	0	2 (11.8%)
	Good	3(37.5%)	3(33.3%)	6 (35.3%)
	Excellent	3(37.5%)	4(44.4%)	7 (41.2%)
	Mean	4.13±0.35	4.00±1.453	4.0±1.173

Objective 1: Discussion

- The baseline study revealed variance in the **five coding** competencies. The study echoes with a statement that the issues that Health Information officers confront vary depending on the experience, size, and complexity of the health facility (Ndidi, 2017).
- The study revealed well-educated and experienced clinical coding health records and information officers.
- The findings resonate with recommendation by the World Health Organization that classified clinical coding as a major and exclusive responsibility of HIM professionals (Taiwo et al., 2015; Darvish et al., 2014).

Objective 2: Completeness in Coding Comorbidities Files

	Pre-training			Post training		
	Complete	Incomplete	Fisher exact	Complete	Incomplete	Fisher exact

MLKH	113 (98.2)	2 (1.7)	0.020	113 (98.3)	2 (1.7)	0.638
MCRH	72 (91.1)	7 (8.9)		78 (98.7)	1 (1.3)	
Total	185 (95.4)	9 (4.6)		191 (98.5)	3 (1.5)	
Completeness in Coding Death Certification Files						
MLKH	27(90.0)	3 (10.0)	0.054	28 (93.3)	2 (6.7)	0.065
MCRH	28 (71.8)	11 (28.2)		39 (100)	0	
Total	55 (79.7)	14 (20.2)		67 (97.1)	2 (2.9)	

Objective 2: Completeness in Coding External Injury Files						
	Pre-training			Post training		
	Complete	Incomplete	Fisher exact	Complete	Incomplete	Fisher Exact
MLKH	6 (50.0)	6(50)	0.000	10 (83.3)	2 (16.7)	0.018
MCRH	72 (97.3)	2(2.7)		74 (100)	0	
Total	78 (90.7)	8 (9.3)		84 (97.7)	2 (2.3)	
Completeness for Medical Procedure Files						
MLKH	9 (33.3)	18(66.7)	0.000	20 (83.3)	7 (16.7)	0.001
MCRH	40 (93)	3 (7.0)		43 (100)	0	
Total	49 (70.0)	21(30.0)		63 (90)	7 (10.0)	

Objective 2 Discussion

- The study found no significant variance in completeness for diagnosis reporting files pre- and post-training. However, files were completely coded after the intervention in MCRH. In general, incompleteness reduced from 2.6% to 0.2% after the training.

- Though this difference was not statistically significant, it provides a strong indication of significant return on investment for training time.
- Just as this present study suggests returns in training, similar findings were reported by Stanfill et al. (2014) that of particular importance is the strong indication of a significant return on investment for staff training time

Objective 3: Appropriate Coding for Diseases and Injuries

	Pre-training				Post training			
	Not coded	Wrongly coded	Rightly coded	F. exact	Not coded	Wrongly coded	Rightly coded	F. exact
MLKH	2(1)	52(27.2)	137(71.7)	0.665	1(0.5)	52(27.2)	138 (72.2)	0.000
MCRH	3(1.3)	53(23.3)	171(75.3)		0	30 (13.2)	197 (86.8)	
Total	5 (1.2)	105 (25.1)	308(73.7)		1(0.2)	82 (19.6)	335 (80.1)	

Appropriate Code for External Causes Injuries

MLKH	6(50)	2(16.7)	4 (33.3)	0.000	2(16.7)	5(41.7)	5 (41.7)	0.000
MCRH	2(2.7)	22(29.7)	50(67.6)		0	4(5.4)	70(94.6)	
Total	8 (9.3)	24 (27.9)	54 (62.8)		1(0.2)	82(19.6)	335 (80.1)	

Objective 3 cont': the Appropriate Coding for Diseases and Injuries

	Pre-training				Post training			
	Not coded	Wrongly coded	Rightly coded	F. exact	Not coded	Wrongly coded	Rightly coded	F. exact
MLKH	18 (66.7)	2(7.4)	7 (25.9)	0.000	7(25.9)	9(33.3)	11 (40.7)	0.000
MCRH	3(7)	23 (53.5)	17(39.5)		0	1(2.3)	42(97.7)	
Total	21(30)	25 (35.7)	24 (34.3)		7(10)	10 (14.3)	53 (70)	

Assigning the Appropriate Code for Death Certification

MLKH	3	18 (60.0)	9(30.0)	0.009	2(6.7)	17(56.7)	11(36.7)	0.000
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	(10.0)						
MCRH	11(28.9)	26(66.7)	2(5.1)		0	3 (7.7)	36 (92.3)
Total	14	44	11		2	20	47

Objective 3: Discussion

- Study analyses revealed variations in accuracy of coding for diseases and injuries.
- The variance was statistically significant after training but non-significant before.
- Based on the results, coding is influenced by both coder awareness level, keenness in documentation and interpretation. Kirpich, Marsano, and McClain (2015) support this result.
- Accuracy for external causes injuries before and after the training varied considerably by hospital. The difference was statistically significant at both surveys ends. The accuracy of coding external cause of injury varied from 64% to 85% in a similar study (Kirpich et al., 2015).
- The study found statistical variation in accurately coding death certification files. Social implications of coding appropriately deter coders from inputting codes to death files (Kirpich, Marsano, and McClain, 2015).

Objective 4: Quality of Clinical Coding Before and After the Training

Group	N	Pre(Mean + SD)	Post (Mean + SD)	t	df	Sig (2 tailed)
Comparison in Assigning the Correct Code for Diseases and Injuries						
MLKH	191	1.71±0.479	1.72±0.463	-0.253	190	0.080
MCRH	227	1.74±0.469	1.87±0.339	-5.015	226	0.000

Comparison in Assigning the Appropriate Code for Comorbidities						
MLKH	115	1.61±0.525	1.63±0.521	-0.498	114	0.619
MCRH	79	1.38±0.647	1.90±0.443	-7.473	78	0.000
Comparison in Assigning the Appropriate Code for External Causes of Injuries						
MLKH	12	0.83 ±0.937	1.25±0.754	-2.159	11	0.054
MCRH	74	1.65±0.535	1.95±0.228	-4.953	73	0.000
Comparison in Assigning the Appropriate Code for Medical Procedure						
MLKH	27	0.59±0.888	1.15±0.818	-4.507	26	0.000
MCRH	43	1.33±0.606	1.98±0.151	-6.969	42	0.000

Objective 4 Discussion

- Training significantly improved quality of clinical coding. This agrees to a WHO, 2015 study.
- ICD system is complex and complicated and may need continuous training to understand
- Simple/Single diagnosis cases were well coded even at baseline study.
- This agrees with Moghaddasi, Rabiei and Sadeghi (2014) who claimed that single diseases are easier to code compared to comorbidities that may require multiple secondary references
- Quality of clinical coding in both health facilities at baseline study was 59.5% on average.
- This agree to a study Lobbestael et al, 2011 global high of 55% and also to a study in KNH by Dr Wanyoike 2013

Conclusion

- Understanding of ICD coding, on how to use ICD-10 and speed of coding were key issue of incompetence

- Coding for comorbidities, death certification and medical procedures were inconsistent and incomplete
- Study revealed inaccuracy in coding diseases and injuries, external causes and file medical procedure before training,
- There was significant improvement in quality of clinical coding after the training

Recommendations

- Clinical coding should be undertaken by experienced coders to enhance speed and competency. On job training should be continuous
- There is need for tailored training to mitigate for Inconsistency and incompleteness in coding comorbidities, death certification and medical procedures

Need for further research

- There is need to undertake research addressing the role of other health providers in improving the quality of coding particularly in diagnostics and cause of death

Acknowledgments

- Chuka University
- Nairobi City County Government
- Management Board-MLKH
- Management Board-MCRH
- Research Assistants- Abel, Cheboi and Koech

CHICKEN-EGG LYSOZYME AS A POTENT ANTIBIOTIC

Presenter: Peter Ochieng Owino and Bonface Shikuku Oloo

Introduction

- Bacterial infections are one of the most prevalent diseases we have today.
- Bacteria relate to several pathogenic infections including pneumonia, acnes, typhoid, tuberculosis, urinary tract infections, among other kinds.
- While most bacteria are harmless some called pathogens can acutely sicken humans.
- UTIs, affects many women worldwide
- Acne pimples affect 85% of youth in USA.
- Respiratory abnormalities result to high deaths

Lysozyme

- Lysozyme is a serine based enzyme that possesses antimicrobial characteristics.
- It binds to bacterial transpeptidases thereby inhibiting peptidoglycan synthesis by Catalyzing cleavage of the β -(1,4) binding of N-acetylglucosamine and N-acetylmuramic acid

Lysozyme occurrence

Lysozyme exists in secretions; tears, saliva, human milk, urine, mucus and chicken egg. Chicken-egg lysozyme is comparably effective for its low minimum inhibitory concentration for antimicrobial action. Heating eggs denatures lysozyme inhibiting its action

Statement of the Problem

Much expenditure in buying antibiotics has arisen. Bacterial resistance against antimicrobial drugs has triggered prolonged consumption of antibiotics. Resulting side effects of much antibiotics has fuelled other infections like liver malfunctions

Objectives

- 1) To synthesis less expensive and advanced antibiotics out of lysozyme from chicken- egg
- 2) To produce efficient drugs with almost zero side effects to consumers.

Literature review

Current bacterial treatments

- Antibiotics such as erythromycin and penicillin are typically or systematically applied
- Hormonal agents are infused in the system
- Killing through application of U.V radiations

Mode of action of lysozyme

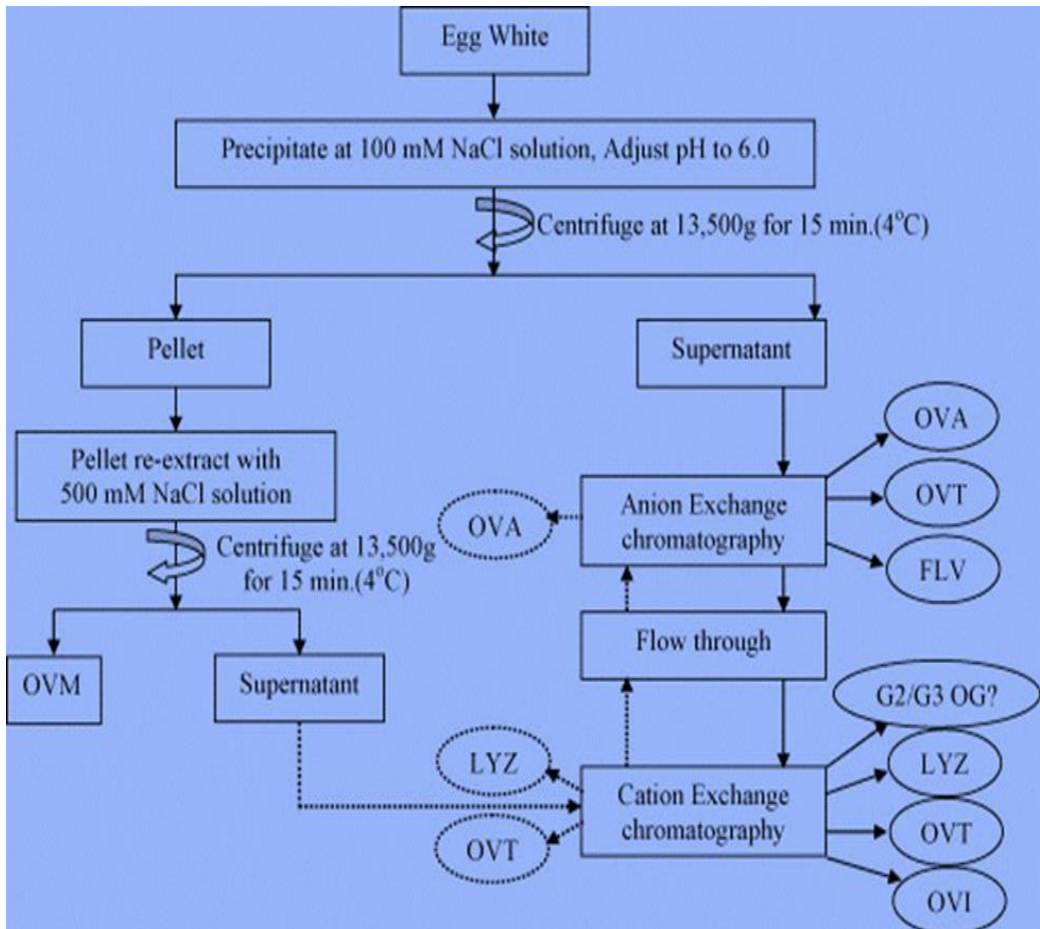
- 1) Giordano *et al* (2017), asserts that progressive lysosomal cell wall rupture gives rise to protoplasts
- 2) On the protoplasts, continuous inflow of water from external surrounding
- 3) This leads to an increase in pressure that finally results in cellular lysis

Methodology

Isolation of lysozyme from egg-white

- 1) Lysozyme shall be separated and identified using cation exchange chromatography

- 2) Cation exchange chromatography is proved best method to isolate lysozyme from egg-white
- 3) This process is carried as follows:



Test samples

- Lysozyme bioactivity on cell walls shall be piloted using *propionibacterium acne* which is a gram-positive anaerobe found in: skin, mucus, the external ear
- The bacteria can generate enzymes which degrade skin hence causing immunogenic responses

- It also plays role in conditions like prostatitis, acne vulgaris, keratitis and endophthalmitis
- Acne pimples is the most common infection related to this bacterium
- Pimples causes anxiety, stress and depression

Isolation of test sample (P. acnes)

- *P. acnes* bacteria shall be isolated from lumps of pimples on the skin
- Using cotton swabs to force out bacteria –containing pus from the gland-follicle interspace

Inoculation of the bacteria

- Since the bacteria is anaerobic culturing shall be done in Thioglycollate broth for 5-7 days in 35-37C
- Sub culturing to 5% sheep's blood agar to isolate pure colonies of *P. acnes*

Antimicrobial susceptibility test (disk diffusion test)

- Disk diffusion test shall be used to determine the diameter of zones of inhibition created by lysozymes
- Standard drugs like gentamycin shall be used for comparison

Results

- Basing on research papers from Carrilo (2016), Emilliano (2017) *et al* on hydrolytic action of lysozyme
- Antibacterial bioactivity of chicken-egg lysozyme is believed to be achieved
- Laboratory findings shall be recorded in one way analysis of variance

Conclusion

Should this research be done further?

- There shall be industrial production lysozyme for laboratory use
- Cheap and novel antibiotics shall be synthesized
- Through betterment healthcare, agenda 2 of the government shall be realized
- Giving farmers reasons to smile by providing a wider market for eggs
- Achievement of 3rd sustainable and development goal of good health and well being

POTENTIAL OF SATELLITE REMOTE SENSING DATA FOR WATER QUALITY ASSESSMENT IN NDAKAINI RESERVOIR DAM, KENYA

Kinoti Kibetu¹, Mwangi J. Muthoni²

¹Geography Section, Department of Social Sciences-Chuka University, ²Galaxy Geo-Consulting Services Inc.



Introduction

Globally, demand for water coupled with pressure from population growth, migration, industrialisation and urbanization has negatively impacted the quality and quantity of fresh water resources (Tessema, 2014; WWAP, 2015). Water for human use requires high standards of quality and monitoring to provide information for detecting contaminants and assessing water suitability (UNEP, 2010). A major challenge in effective monitoring of water quality is the lack of adequate and updated information since most methods used are in situ and measure water quality parameters at selected sample points and cannot cover the whole water body (Abdelmalik, 2018). Satellite remote sensing data holds significant potential for assessing water quality and its associated tropic states (Mathews, 2011; Saadi et al., 2014). This is because satellites have a repetitive coverage and synoptic view of the globe enhancing data availability of most regions. Given the shortcomings of in situ measurements and need to explore potential of earth observation imageries in predicting water quality at a spatio-temporal scale, the study aimed to assess water quality parameters especially Chlorophyll *a* levels, Water Surface Temperature and Suspended Sediment Loads within Ndakaini dam before and after the "April-May 2018" floods using Landsat 8 OLI/TIRS data.

Study Area

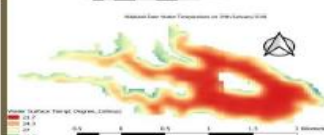
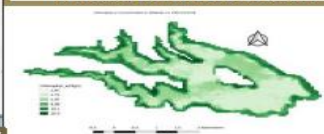


- Ndakaini dam supplies over 84% of water to Nairobi County
- Lies between latitudes 0°48' to 0°49' South & Longitudes 36°49' to 36°51' East on 2041m a.s.l
- It covers 1200 acres
- Dam's water capacity when full is 600 acres

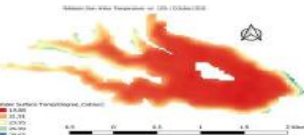
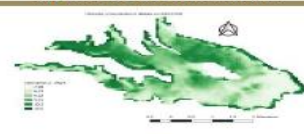
Conclusion

Tropic State Index (TSI) value designates Ndakaini dam as low-level polluted mesotrophic lake. The reservoir's water capacity was 457.02 acres "before" and 574.89 acres "after" the floods

"Before" the floods scenario



"After" the floods scenario



References: Abdelmalik, K.W. (2018). Role of statistical remote sensing for inland water quality parameters prediction. *The Egyptian Journal of Remote Sensing and Space Sciences* 21:193-200; Tessema B (2014). Assessment of Physico-chemical Water Quality of Bura Dam, Bati Wereda. *Journal of Aquatic Resources Development* 5(6),1-4; Saadi A., Younsy M., Jahin H. (2014). Statistical estimation of Rosetta branch water quality using multi-spectral data. *Water Science Journal*, 28:18-30; Mathews, M. (2011). A current review of empirical procedures of remote sensing in inland and near-coastal transitional waters. *International Journal of Remote Sensing*, 32 (21), 6855-6899; UNEP. (2010). Clearing the waters. A focus of water quality solutions. Accessed from <http://www.unep.org> on 16th October 2018; WWAP. (2015). *The United Nations World Water Development Report 2015: Water for a Sustainable World*. Paris, UNESCO

Materials and Methods

- Landsat 8 Operation Land Imager Bands 1, 2, 3 & 4 and Thermal Infrared Sensor Band 10 images were used.
- Image Path 168, Row 6 downloaded from USGS Earth explorer website.
- Images for 29th January 2018 and 12th October 2018 had cloud cover of less than 8% and were used in mapping the "before" and "after" floods scenarios.
- Radiometric correction was done to convert DN to Spectral Radiance Signal using: $LA = [(LMAX1 - LMIN1) / (QCALMAX)] * QCAL + LMIN1$
- Chlorophyll *a* levels mapped using Normalized Digital Water Index algorithm: $CHL_A = 17.878 * (OLI4 - OLI1) / (OLI4 + OLI1) + 5.636$
- Band 10 DNs converted into the top of atmosphere (TOA) spectral radiance using $LA = (0.0003342 * Qcal_B10) + 0.1$. Then TOA values converted into brightness temperature using: $T = 1321.0789 / LN(774.8853 / RAD_B10) + 1$
- Spatial-temporal variation in suspended sediments loads calculated using algorithm: $SS = 13181 * OLI42 - 1408.6 * OLI4 + 44.15$
- Computed Chlorophyll *a* values were then used to compute the dam's Tropic State Index as $TSI = 10 [6 - (2.04 - 0.68LN(CHL - A)) / LN2]$

Findings and Discussion

- Chlorophyll *a* levels "before" floods were higher at between 5.87-20.9mg/L with average of 10.42mg/L than those of "after" floods which ranged from 7.94-15.60 mg/L with average of 10.16mg/L
- Dam water surface temperature "before" floods ranged from 21.7°C to 32.3°C with mean of 27.0°C.
- Temperatures mapped for "after" floods ranged between 19.9°C to 28.03°C with a mean of 24°C. Thus lower water surface temperatures were recorded "after" compared to "before" floods.
- Suspended Sediment load across the dam ranged from 45.84mg/L "before" the floods to 48.4mg/L "after" the floods. There was increase of 2.57mg/L sediment concentration
- Observed Spatio-temporal variations in water quality parameters attributed to flood related nutrient inputs and increased water levels from streams feeding into the reservoir

**ATTITUDES RELATED TO TRADITIONAL AND MODERN
SOCIETY QUARTER LIFE CRISIS IN THE KENYAN CONTEXT
AND PSYCHO-EDUCATIONAL INTERVENTION**

Authors: Dr. Monicah Buyatsi Oundo and Dr. Grace Gatune Murithi

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Terminology: Quarter life crisis refers to the anxiety an individual has over direction and quality of life during transition into adulthood.



TRADITIONAL SOCIETY

[Minimal quarter life crisis]

1. Life skills development [farming, hunting, cooking, gathering, fishing]
2. Inheritance [land, animals]
3. Taboos [control behaviour]
4. Interdependence [Everyone had a role to play in advancing the society as a unit]
5. Contentment [People were gratified]
6. Production [spears, ornaments, tools, food]
7. Simplicity [Simple tools that enhanced interpersonal relationships and psychological well-being]
8. Social support system [traditions, rituals, values]

Symptoms of quarter life crisis

Inability to make decisions;
Feeling trapped with no options;
Frustration;
Feeling like a failure in life;
Tendency to isolate;
Feeling left behind by schoolmates;
Losing confidence in life;
Depression;
Insecurity about the near future;
Feeling like being a burden to significant others;
Loss of motivation

MODERN SOCIETY

[Severe quarter life crisis]

1. Professional skills development [employable career skills]
2. Unemployment
3. Human rights [permissiveness]

4. Dependence [On parents, government, well-wishers, friends, loans, fundraising]
5. Affluence [People compete for the best]
6. Consumerism [Impulse buying, Corruption]
7. Technological advancement [Accumulation of gargets that fuel wastage of resources, social media addiction, isolation]
8. Individualism

PSYCHO-EDUCATIONAL INTERVENTION [Minimal quarter life crisis]

1. Self-education [talent development, entrepreneurial skills, wealth creation]
2. Investment
3. Reality check [moderate behaviour]
4. Independence [Individuals plan for a life time and for future generations]
5. Stability [Search for long term gratification]
6. Responsibility [Knowing when it's enough]
7. Minimalism [Use of green technology, Frugality, Improvising]
8. Self-support system [Insurance, Emergency funds, Retirement income]

BSc. in WILDLIFE AND ENTERPRISE MANAGEMENT CLUB

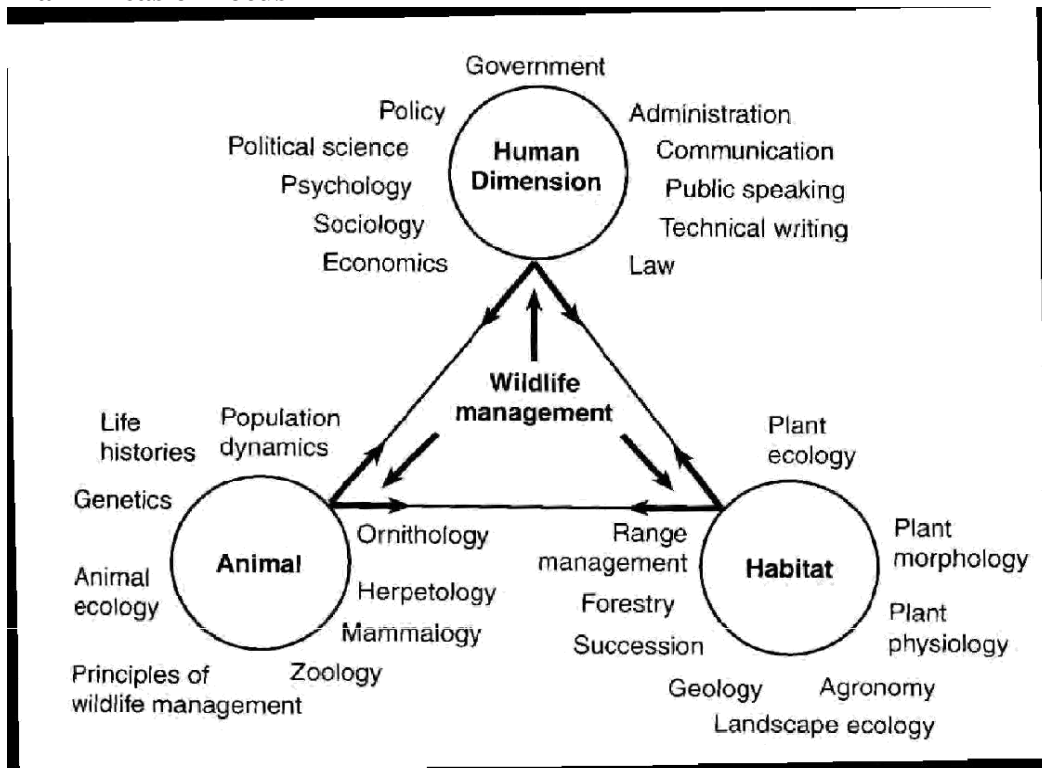
Philosophy

Human beings are responsible for governing the nation of life and intellectual conservation is planned and carried to achieve a composite and harmonious coexistence of all living things for the benefit of man and all living things.

Goal

The programme provides a broad and specialized training for students who wish to develop careers in areas related to wildlife enterprise development and management, resource use, protection and conservation of wildlife ecosystems.

Main Areas of Focus



Our Partners and Career Opportunities



**FARMER AGRI-PRENEURSHIP FOR FOOD AND NUTRITION
SECURITY**

Dr. Geoffrey K. Gathungu



Simple Irrigation Technique



Postharvest Management



Value Addition

Agri-prenuership the New Approach to Support Agricultural Development

- Global challenges affect the sustainability of food and agriculture systems towards achieving the right to adequate food
- Farmers are main actors in agricultural development and their Internal potential (Entrepreneurship) is key to achieve food self-sufficiency



Positive Seed Selection



Use of Drone Technology



Farmer Partnership



Diversified Food Products

Farmer Entrepreneurship a Key Competency

- Entrepreneurial farmers have creative thinking and innovative behavior and are willing to take risks for agribusiness development
- Farmer entrepreneurship improve farm performance followed by increasing agricultural production towards national food self-sufficiency
- Farmer entrepreneurship makes farmers to be change agents' due to their resilience and adaptability, participatory ability, self-regulation and other self-oriented competence



UTILIZATION OF BANANA INFLORESCENCE AS VEGETABLE TO ENHANCE FOOD AND NUTRITIONAL SECURITY

By FELISTER KEMUNTO MBAKA



Chuka university

Knowledge is Power

Purpose of the study

Despite the nutritional composition of banana inflorescences its utilization and value addition in Kenyan communities is not well known. Utilization of banana inflorescence will greatly help to alleviate the problems of malnutrition thus promoting food nutritional and food security in different communities. Therefore there is need to promote awareness of banana utilization as vegetable and value addition.

Back ground of the study

Banana inflorescence is a complex structure that includes the flowers that will develop into fruits. In Indian it is Banana inflorescences widely consumed as vegetables. Both the inflorescence covers and flowers can be cooked together or separate depending on the consumer's preference. Both the banana and inflorescences have high nutritional value.

Health benefits

Banana flower has outstanding medicinal properties and potent nutritional profile and treatment for infections, slows the aging process, promotes heart health, improves digestion and regulates blood sugar.



Preparation and cooking

- ❖ Harvest the banana inflorescence and remove the black stem from the florets
- ❖ Peel the bright purple coloured covers and tender flowers can be cooked together or separate (this depends on one's preference)
- ❖ Put them in water mixed with citric acid to avoid loss of Vitamin C (due to oxidation) for 10 minutes
- ❖ Rinse and drain the soaked covers or flowers, slice them thinly like lettuce
- ❖ Boil for 10-20 minutes
- ❖ Prepare other stir fry ingredients like onions, tomatoes, amaranths (this depends on one's preference)
- ❖ Fry the boiled banana inflorescences
- ❖ Fried inflorescence can be served with ugali, rice, cooked matoke, chapatti etc

Nutritional benefits

Banana flower is packed with essential minerals such as phosphorous, calcium, potassium, vitamin, copper, magnesium and iron which are vital for several bodily functions. Energy 51 kJcal, Protein 1.6 g, Fat 0.6 g, Carbohydrate 9.9 g, fibre, 5.7 g, calcium 56 mg, Phosphorous 73.3 mg, iron, 56.4 mg, vitamin E, 1.07 mg. (According to the African Journal of Biotechnology).

Value addition

Banana inflorescences will be subjected to blanching, and drying to produce dried inflorescences vegetable that one can rehydrate for use and powdered inflorescence vegetable to formulate or to improve other food products



INTEGRATION OF ZAI PIT IN SOIL MOISTURE CONSERVATION, NUTRIENT AVAILABILITY AND IMPROVED CROP YIELDS IN SEMI-ARID AREAS

By FELISTER KEMUNTO MBAKA



Chuka university

INTRODUCTION

Zai pits increase the amount of water stored in the soil profile by trapping or holding rains. Water stored in the zai delay the onset and occurrence of severe water stress thereby buffering the crop against damage caused by water deficits during dry periods. Zai can collect up to 25% or more of a run-off coming from 5 times its. Zai Pit technology increases crop yield on highly degraded soils and helps to alleviate the adverse effects of dry spells.

Inadequate water and low nutrient supply have been major constraints in crop productivity in the world. Water and nutrients thus interact in limiting crop growth. Moreover, high frequency of dry spells and droughts that characterize rainfed agriculture in Africa threaten national food demand projected by 2050. Zai pit is one of the successful interventions that improve precipitation capture, reduce runoff and evaporation, and improve agricultural productivity.



Preparation of Zai pit



Zai pit ready for planting



Intercropped legumes and sorghum in Zai pits



Sorghum grown in Zai pits

Knowledge is Power



BREAST SELF EXAMINATION (BSE)

To be done regularly

STEP 1: INSPECTION

In good lighting, stand in front of a mirror and look at your breasts. Turn from side to side examining your breasts thoroughly.

With arms relaxed at your sides, look for any change in the size or shape of the breast, dimpling of the skin or change in the nipple such as scaling or discharge.



With arms held over your head, check to see whether breasts move up and down together. Lift your breasts to look for sores or dimpling.

With hands on hips, press arms to tighten the chest muscles. Turn from side to side to view all areas of your breasts. Look for any dimpling or changes in the skin.



STEP 2: PALPATION OR FEELING

To examine your left breast, put your left hand behind your head, with the three middle fingers of your right hand held flat and together firmly press on the breast, using vertical stripe motions. Reverse the procedure for the right breast examination.

Be sure to use the flat surface of the three middle fingers



To examine 100% of the tissue where lumps can form, run your fingers in vertical strips from the bottom of the breast to the collarbone beginning from the armpit to the center of the chest. Cover all areas including the breast tissue leading to the underarm area. Reverse the procedure for the right breast.

In shower or bath,

glide your fingers in vertical strips over wet soapy skin. This makes it easier to feel any changes in your breast such as lumps, knots, tenderness, etc



Underarm Examination



Examine the left underarm area using your right arm, with your left arm held loosely at your side. Cup the fingers of the right hand and insert them high into the underarm area. Draw fingers down slowly, pressing in vertical pattern covering

all areas. Reverse the procedure for the right underarm.

Lying Down



While lying flat, place a small pillow or folded towel under the right shoulder and your right hand behind your head. Using your left hand, feel the right breast using the same vertical motion as was used in the shower. Cover all areas of the breast as well as the underarms' area. Repeat this procedure for the left breast.

Any CHANGE from the previous exam should be brought to the immediate attention of your physician or health care provider.

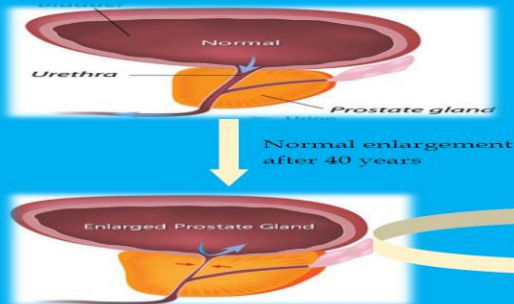


PROSTATE CANCER

CHUKA UNIVERSITY

THE THIRD OPEN RESEARCH AND CAREER WEEK 2ND-6TH MARCH 2020
 THEME: "Developing Research Enterprises and Innovative Careers for a Prosperous Economy"

Prostate cancer is the commonest cancer among males in Kenya. Patients with prostate cancer in Kenya present at a similar mean age at diagnosis, but with more advanced disease and more aggressive tumors (Ministry of Health, Kenya).



- Risk Factors**
- Age above 40 years
 - Family History
 - Exposure to heavy metals such as cadmium
 - Cigarette smoking
 - High-fat diet and Obesity
 - African Descent



- Prostate cancer occurs without symptoms in its earliest stages.
- Signs and Symptoms**
- Straining while passing urine
 - Leaking urine
 - Urination of blood
 - Bone pain

- Screening**
- Screening is done as a blood test called Prostate Specific Antigen (PSA) test that helps in identifying various abnormalities of prostate combined with Digital Rectal Examination (DRE)
 - The Ministry of Health recommends prostate cancer screening to African men after the age 40 years.
 - Those with a family history of prostate cancer should be screened annually .
 - Men without a family history of prostate cancer should be screened biannually.

- Reducing the Risk of Prostate Cancer**
- Some risk factors such as age, family history, and race cannot be helped.
 - You may be able to reduce your risk of prostate cancer by:
 - Eating a healthy diet
 - Not smoking
 - Maintaining a healthy body weight

- Treatment**
- Treatment is majorly dependent on the stage and how aggressive the disease is.
 - Available options include surgery, radiotherapy, and chemotherapy

The prognosis of prostate cancer is good if the disease is detected and treated early enough.

STD Facts

STD	What to Watch For	How You Get It	If You Don't Get Treated
Chlamydia	<ul style="list-style-type: none"> Symptoms may show up several weeks after having sex. Most women and some men have no symptoms. Women: <ul style="list-style-type: none"> Discharge from the vagina. Bleeding from the vagina between periods. Burning or pain when you urinate. Need to urinate more often. Pain in abdomen, sometimes with fever and nausea. Men: <ul style="list-style-type: none"> Watery, white drip from the penis. Burning or pain when you urinate. Need to urinate more often. Swollen or tender testicles. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex with someone who has chlamydia. 	<ul style="list-style-type: none"> You can give chlamydia to your sex partner(s). Can lead to more serious infection. Reproductive organs can be damaged. Can lead to arthritis. Women, and possibly men may no longer be able to have children. A mother with chlamydia can give it to her baby during childbirth. A mother with chlamydia may give birth too early.
Gonorrhea	<ul style="list-style-type: none"> Symptoms may show up 1–14 days after having sex. Most women and some men have no symptoms. Women: <ul style="list-style-type: none"> Thick yellow or gray discharge from the vagina. Burning or pain when you urinate or have a bowel movement. Abnormal periods or bleeding between periods. Cramps and pain in the lower abdomen (belly). Men: <ul style="list-style-type: none"> Thick yellow or greenish drip from the penis. Burning or pain when you urinate or have a bowel movement. Need to urinate more often. Swollen or tender testicles. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex with someone who has gonorrhea. 	<ul style="list-style-type: none"> You can give gonorrhea to your sex partner(s). Can lead to more serious infection. Reproductive organs can be damaged. Both men and women may no longer be able to have children. Can cause heart trouble, skin disease, arthritis and blindness. A mother with gonorrhea can give it to her baby in the womb or during childbirth.
Hepatitis B	<ul style="list-style-type: none"> Symptoms show up between 6 weeks and 6 months after contact with the hepatitis B virus. Many people have no symptoms or mild symptoms. Flu-like feelings and tiredness that don't go away. Pain in abdomen, nausea, vomiting. Jaundice (yellow skin). Dark urine, light-colored bowel movements. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex with someone who has hepatitis B. Spread by sharing needles to inject drugs, or for any other reason. Spread by contact with infected blood. 	<ul style="list-style-type: none"> You can give hepatitis B to your sex partner(s) or someone you share a needle with. Some people recover completely. Some people cannot be cured. Symptoms go away, but they can still give hepatitis B to others. Can cause permanent liver damage or liver cancer. A mother with hepatitis B can give it to her baby during childbirth.
Herpes	<ul style="list-style-type: none"> Symptoms may show up 2–12 days after having sex. Many people have no symptoms. Flu-like feelings. Small, painful blisters on the sex organs or mouth. Itching or burning before the blisters appear. Blisters last 1–4 weeks. Blisters go away, but can come back at any time. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex, and sometimes by genital touching, with someone who has herpes. 	<ul style="list-style-type: none"> You can give herpes to your sex partner(s). Herpes cannot be cured, but medicine can control it. A mother with herpes can give it to her baby during childbirth. Can make it easier to get HIV.
HIV/AIDS	<ul style="list-style-type: none"> Symptoms may show up weeks, months or years after contact with HIV, the virus that causes AIDS. Can be present for many years with no symptoms. Unexplained weight loss or tiredness. Flu-like feelings that don't go away. Diarrhea. White spots in mouth. In women, yeast infections that don't go away. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex with someone who has HIV. Spread by sharing needles to inject drugs, or for any other reason. Spread by contact with infected blood. 	<ul style="list-style-type: none"> You can give HIV to your sex partner(s) or someone you share a needle with. HIV cannot be cured. Can cause illness and death, but medicines can control it. A mother with HIV can give it to her baby in the womb, during birth or while breastfeeding.
HPV/ Genital Warts	<ul style="list-style-type: none"> Symptoms may show up weeks, months or years after contact with HPV. Many people have no symptoms. Some types cause genital warts: <ul style="list-style-type: none"> Small, bumpy warts on the sex organs and anus. Itching or burning around the sex organs. After warts go away, the virus sometimes stays in the body. The warts can come back. Some types cause: <ul style="list-style-type: none"> Cervical cancer as well as cancer of the vulva, vagina, throat, anus or penis. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex, and sometimes by genital touching, with someone who has HPV. 	<ul style="list-style-type: none"> You can give HPV to your sex partner(s). Most HPV goes away on its own in about 2 years. Warts may go away on their own, remain unchanged, or grow and spread. A mother with warts can give them to her baby during childbirth. Some types can lead to cervical cancer if not found and treated.
Syphilis	<p>1st Stage:</p> <ul style="list-style-type: none"> Symptoms show up 1–12 weeks after having sex. A usually painless sore or sores on the mouth or sex organs. Sore lasts 2–6 weeks. Sore goes away, but you still have syphilis. <p>2nd Stage:</p> <ul style="list-style-type: none"> Symptoms show up as the sore heals or after. A rash anywhere on the body. Flu-like feelings. Rash and flu-like feelings go away, but you still have syphilis. 	<ul style="list-style-type: none"> Spread during vaginal, anal or oral sex, and sometimes by genital touching, with someone who has syphilis. 	<ul style="list-style-type: none"> You can give syphilis to your sex partner(s). A mother with syphilis can give it to her baby during pregnancy or have a miscarriage. Can cause heart disease, brain damage, blindness and death.
Trichomoniasis ("Trich")	<ul style="list-style-type: none"> Symptoms may show up 5–28 days after having sex. Affects both women and men. Many people have no symptoms. Women: <ul style="list-style-type: none"> Itching, burning or irritation in the vagina. Yellow, greenish or gray discharge from the vagina. Men: <ul style="list-style-type: none"> Watery, white drip from the penis. Burning or pain when you urinate. Need to urinate more often. 	<ul style="list-style-type: none"> Spread during vaginal sex. 	<ul style="list-style-type: none"> You can give trich to your sex partner(s). Uncomfortable symptoms will continue. Men can get infections in the prostate gland. Can make it easier to get other STDs, including HIV.

CHUKA UNIVERSITY WILDLIFE CLUB



Vision: Conservation for better tomorrow

Mission: To develop better understanding of need to conserve wildlife and other natural resources for better utilization for the future

Main Club Activities

- ✓ Tree identification and bird watching
- ✓ Trips and excursion
- ✓ Clean-up of local market
- ✓ Outreach e.g. tree planting and community
- ✓ Awareness on biology of conservation
- ✓ Camping
- ✓ Hiking
- ✓ Essay writing competition and proposals.
- ✓ Education e.g. mentorship and career talks



Aims and Objectives

- To alert the general public about the great cultural, environmental, aesthetic and economic value of natural resources
- To enlighten members and involving them in national activities such as tree planting.
- Improve professionalism of members through participation in club activities such as debates, seminars, camping and bird watching.
- Identify and encourage income generating activities for better growth of the organization.
- Advocate for conservation and sustainable utilization of available resources in the university
- Enlighten members on career opportunities available in wildlife and enterprise management
- Identify the role of wildlife conservation towards realization of vision 2030



Camping



Hiking



Mentorship



Tree planting



Tree planting



Conservation Biology

A food safety move to eliminate in-feed antibiotics increases piglets' sulfur amino acid requirements

Presenter: Dr. Roseline Kahindi



- Use of sub-therapeutic levels of antibiotics as antimicrobial growth promoters in piglets' feed can lead to drug resistance in human beings.
- Alternatives to use antibiotics as growth promoters include bio-fortification. Some of the nutrients that can be used are amino acids that serve both in promoting immunity and the growth of the piglets. Some of such amino acids are the sulphur amino acids.
- Methionine and cysteine contain sulphur in their structure, therefore, forming the dietary sulphur amino acids (**SAA**). These SAA requirements are often given as a ratio to lysine which is the first limiting amino acid.
- The current SAA ratio to lysine for weaned piglets ranges between 54 to 57% (Figure 1). These values were obtained from piglets that had AGP in their diets.

Figure: 1 SAA: Lys % requirement for piglets fed AGP-fortified diets

Reference	SAA: Lys %
National Research Council, 1998	57
Dean et al., 2007	54
Moehn et al., 2008	55
National Research Council, 2012	55

However, through nutritional intervention a farmer can use antibiotic-free diets. A potentially important method is to increase the dietary SAA to levels exceeding recommendations that have been established.

Although dietary SAA of 55% is enough for AGP fed piglets, this content is not enough to promote similar growth under the AGP-free feeding. If the dietary sources of SAA are not sufficient to support body requirement, there will be increased muscle wasting leading to weight loss and health deterioration. (Figure 2)

Figure 2: emaciated piglets versus healthy piglets



Studies are showing that there is need to increase the dietary SAA content from 55 to 60% (Figure 3 to 5)

Figure 4: Increasing SAA levels on growth

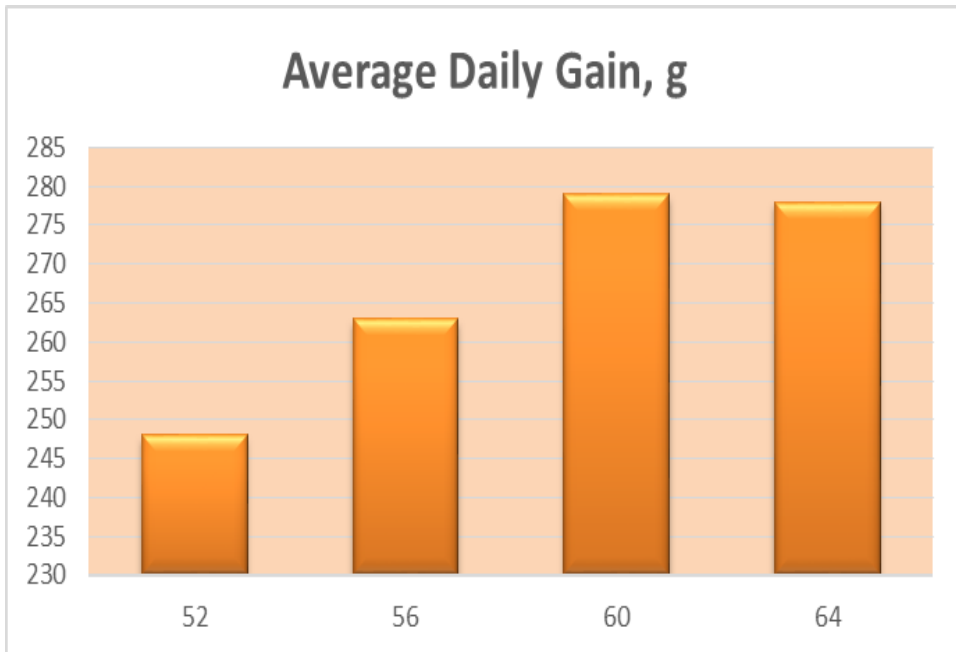


Figure 5: Increasing SAA levels on feed intake

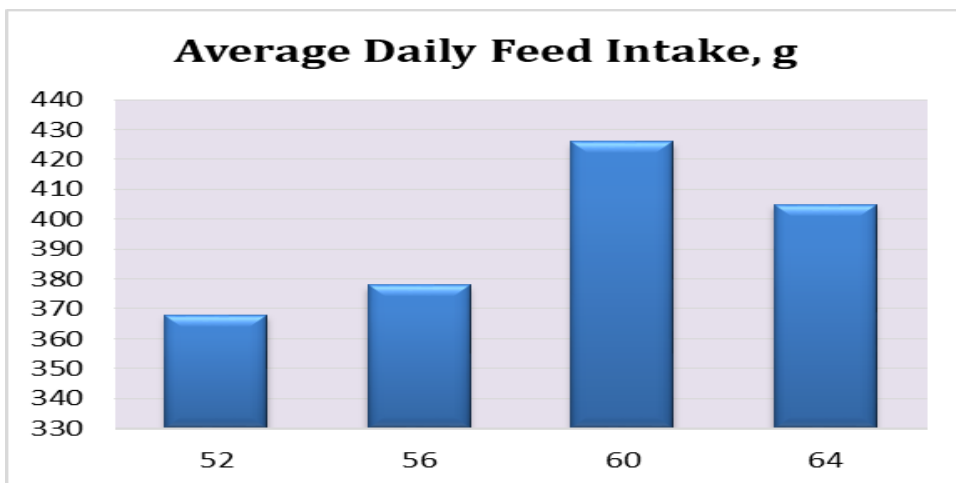
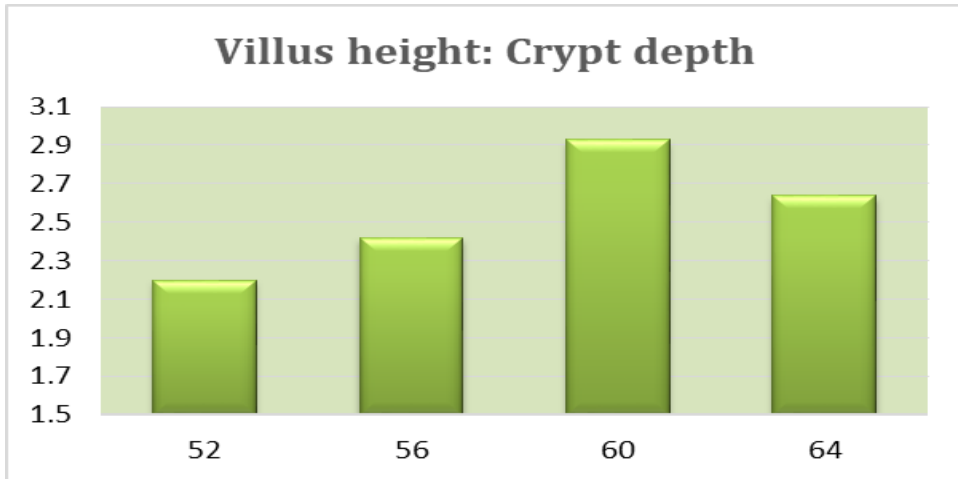


Figure 6: Increasing SAA levels on intestinal morphology



Outcome of increased dietary sulphur amino acids

- Attained growth rate similar to those fed AGP.
- Minimize antibiotic resistance in pigs caused by use of sub-therapeutic or low levels of antibiotics in the diet.
- No incidence of diarrhoea or illness.
- Reduced cost of production due to less feed cost and less time to market.

Animal Welfare

Department of Animal Sciences, Chuka University

Means how an animal is coping up with the condition in which it lives.

Good animal welfare requires disease prevention and Veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter

FIVE ANIMAL FREEDOMS

RIGHT

WRONG

Freedom from hunger and thirst



Freedom from discomfort



Freedom from pain, injury and disease



Freedom to express normal behaviour



Freedom from fear and distress

ANIMALS HAVE FEELINGS TOO

You can judge a man's true character by the way he treats his fellow animals

Sir Paul McCartney

Yield Gap and CIAT Research Findings on Causes of Large Gaps in Maize Yields on Smallholder Farms in Mukuyu-Lugari

Farmer Feedback Workshop; Filling the Gap



INTRODUCTION

Maize production on smallholder farms is low and this has resulted in large difference/gap in yield between potential and actual yield being harvested.

The yield gap project sought to understand factors that are causing large difference/gap in maize yields on smallholder farms and give recommendation on improving the yield.

METHOD; What was done

Soil sampling and testing



Aerial Imagery



Field measurements



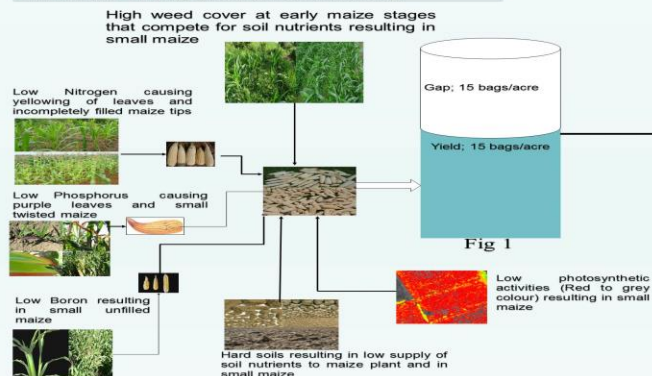
Household surveys



RESULTS

- > Farmers are harvesting averagely 15 bags/acre (Fig1).
- > However, the potential yield is 30 bags/acre (Fig 2)
- > This has resulted in a yield difference/gap of 15 bags.

Causes of 15 bag yield difference/Gap



RECOMMENDATIONS; Improving maize yield (filling the gap)

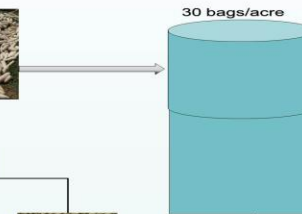
Plant maize at spacing of 75cm by 15cm (75cm between lines and 15cm between plants) to achieve about 22000 maize/acre



Weed 2 times; at 2nd and 6th weeks after germination to reduce weed cover and increase nutrient availability to maize plants to achieve large maize



Fertilizer application at 95kgs kgs/acre to increase nutrient supply for fairly high photosynthetic activity (Yellow-green colour) resulting in bigger maize with completely filled tips



Start Land preparation during dry periods; and do at least 3 times before planting to achieve fine soil for easy root growth and supply of nutrients

Getting 30 bags/acre (Filling the gap)

CONCLUSION

- Good soil nutrition ensures strong and health maize plants; consider the following
- > Apply lime 3-2 months before planting for low soil pH below 6 to reduce acidity. Or use fertilizer containing Calcium and Magnesium.
 - > Use Fertilizers that have Phosphorus, Nitrogen and Potassium at planting e.g DAP, Mavuno depending on soil pH.
 - > Top dress with Urea or CAN at 3 to 4 weeks, followed by second top dressing just two weeks before flowering.
 - > Apply foliar fertilizer containing Boron and Calcium at flowering.
 - > Leave Maize and bean stalks on the fields to improve soil fertility. Control soil erosion by intercropping beans with maize, planting grass strips.
 - > Apply farmyard and compost manure to achieve health maize plants. Falling Grevillea tree leaves contain high Nitrogen and can be decomposed to form manure.

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Local Authority
Local Agricultural Officers

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"Agriculture is our wisest pursuit, because it will in the end contribute most to real wealth, good morals, and happiness."

GREEN GROWTH

Faculty of Humanities and Social Sciences

Green growth is about fostering economic growth and development while ensuring social inclusivity and natural assets continue to provide resources and environmental services on which our well-being relies (OECD, 2011).

G- Generating and storing renew able energy such as geothermal, wind, solar and water.

R- Resource efficiency through recycling

E- Efficient resources use

E- Educate and create awareness thus enhancing inclusivity

N- Natural habitat protected

LOW CARBONEMISSIONS + Recycling and resource efficiency +
SOCIAL INCLUSIVITY = SUSTAINABLEDEVELOPMENT

BENEFITS OF GREEN GROWTH

- Creation of employment
- Green growth
- Poverty alleviation
- Increased productivity
- Increased yield
- Food security

A green entrepreneur or ‘ecopreneur’ contributes to green growth by engaging in economic activities of production and consumption of goods and

services without exposing future generations to environmental risks and ecological scarcities.

BENEFITS OF GREEN ENTREPRENEURSHIP

- Green entrepreneurship not only creates opportunities for innovation and job creation but also leads to environmental conservation leading to sustainable development.
- Green entrepreneurship involves stake holders in adopting the approach making it collective, inclusive and sustainable.
- Innovations of the green entrepreneur have high value for sustainable development because they are based on the idea of a collaborative or sharing economy, in which people generate value together by pooling unused resources, goods, services, spaces, etc.

THE PRACTICE OF A GREEN ENTREPRENEUR IS AS FOLLOWS:

- Minimise the use of energy and water and recycle them whenever possible;
- Use renewable energy and ecological materials;
- Avoids the use of toxic substances;
- Utilises locally available materials;
- Regard waste as a valuable resource;
- Regenerate biodiversity.



CHUKA UNIVERSITY.

PINK HUB CLUB.

Cruising in Tech, Nurturing Innovation.

WELCOME ALL LADIES.
REGISTRATION ONGOING.

#WOMENINTECH



CHUKA UNIVERSITY

PINK HUB CLUB

Cruising in Tech, Nurturing Innovation.



MISSION

To empower women and girls in ICT in fostering innovation and promoting industrialization.

OBJECTIVES

1. To provide a forum for women and girls in computing and ICT, to harness and develop skills in software development, computer hardware and related computing areas.
2. To participate in the promotion, fulfillment, and realization of Sustainable Development Goals.
3. To form associations with other bodies that emulate similar objectives and interest.

p i n k h u b @ g m a i l . c o m

Patron: Sheila Codawa, Department of ICT, Chuka University



**OFFICE OF
CAREER SERVICES
CHUKA UNIVERSITY**

THE MISSION

TO SUPPORT THE VISION OF CHUKA UNIVERSITY BY EMPOWERING STUDENTS TO MAKE THE RIGHT CAREER CHOICES THROUGH ACADEMIC ADVISING, CAREER COUNSELLING AND LINKAGES.

THE VISION

ENVISION A HOLISTIC GRADUATE EQUIPPED WITH SOFT AND PRACTICAL SKILLS FOR THE JOB MARKET

CORE VALUES

- CUSTOMER FOCUS
- INNOVATION
- INTEGRITY
- PROFESSIONALISM AND CONFIDENTIALITY
- PRUDENT USE OF RESOURCES TIMELINES AND DEVOTION TO DUTY



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**CHUKA UNIVERSITY CAMPUSES:
IGEMBE CAMPUS
CHOGORIA CAMPUS
EMBU CAMPUS
CONSTITUENT COLLEGE:
THARAKA UNIVERSITY COLLEGE**



**OFFICE OF
CAREER SERVICES
CHUKA UNIVERSITY**



STUDENT CAREER AMBASSADORS' TRAINING

The Mission:

To support the vision of Chuka University by empowering students to make the right career choices through Academic Advising, Career counselling and linkaGes.

OFFICE OF CAREER SERVICES

Vision:

Envision a holistic graduate equipped with soft and practical skills for the job market

OUR CORE VALUES

Customer focus
Innovation
Integrity
Professionalism and confidentiality
Prudent use of resources
Timelines and devotion to duty



STUDENT CAREER AMBASSADORS' TRAINING

ACTIVITIES OF THE OCS:

- I) ACADEMIC ADVISING
- II) CAREER SERVICES
- III) COUNSELING SERVICES
- IV) LINKAGE BETWEEN INDUSTRIES AND STUDENTS
- V) HIGH SCHOOL RECRUITMENT
- VI) INTRA-INSTITUTIONAL EXCHANGES
- VII) APPRENTICESHIP SERVICES
- VIII) ESTABLISHING ALUMNI NETWORK
- IX) CREATE AN ENTREPRENEURIAL INCUBATOR
- X) RECRUIT STUDENT CAREER AMBASSADORS
- XI) RECRUITMENT CAREER FAIRS
- XII) VENTURE CAPITAL FAIRS



PARTICIPANTS UNDERGOING MENTORSHIP FOR THEIR ENTREPRENEURIAL IDEAS DURING THE START UP EVENT

WHY CHUKA UNIVERSITY IS THE UNIVERSITY OF CHOICE

- A) ALL ACADEMIC PROGRAMMES ARE ACCREDITED BY THE COMMISSION FOR UNIVERSITY EDUCATION
- B) QUALIFIED AND COMPETENT STAFF
- C) SERENE LEARNING ENVIRONMENT
- D) FLEXIBLE MODES OF STUDY TO INCREASE ACCESS TO EDUCATION
- E) AFFORDABLE FEES
- F) WORK STUDY PROGRAMMES
- G) MARKET DRIVEN ACADEMIC PROGRAMMES HENCE HIGH RATE OF EMPLOYABILITY OF OUR GRADUATES
- H) DEVELOPED INFRASTRUCTURE AND STATE OF THE ART LEARNING FACILITIES AND EQUIPMENT
- I) ACCESS TO SCHOLARSHIPS



HIGH SCHOOL STUDENTS AT THE CHUKA UNIVERSITY STAND DURING THE NYERI AGRICULTURAL SHOW

CHUKA UNIVERSITY IS ISO 9001:2015 CERTIFIED

INSPIRING ENVIRONMENTAL SUSTAINABILITY FOR BETTER LIFE





Knowledge is Wealth (*Sapientia divitia est*) Akili ni Mali
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DEVELOPING ENTREPRENEURIAL UNIVERSITIES IN KENYA (DEpUK) PROGRAMME

Entrepreneurship is a key pillar for any vibrant economy of a given country. Kenya being a developing nation falls under a great necessity of laying down a blue print on entrepreneurship to meet the demand of the highly dependent and growing population. Entrepreneurship has become a remedy to the high rates of unemployment and most importantly a major contributor to the country's gross domestic product. It is against this backdrop that Chuka University has embarked on the field of entrepreneurship by laying down entrepreneurial initiatives that would help mitigate the levels of unemployment and inculcate the culture of innovation among the University Students. This will stimulate development of entrepreneurship, which will drive job creation in Kenya. The initiative will support the students and staff to become entrepreneurs and job creators, and stimulate economic development in the region. The project is meant to prepare Chuka University to enter into the league of Entrepreneurial Universities, which leverages on research and innovations to create intellectual property rights, spin-off companies and entrepreneurs to promote sustainable economic growth of the University and the Nation.

- Agendas of the programme**
- Promoting research & innovation
 - Business startups
 - Entrepreneurial training
 - Science and Technology Parks (STP)
- Partnership**
- Dedan Kimathi University
 - Karatina University
 - Saarland University of Germany
- Target**
- Students with innovative ideas
 - Staff
 - Industries
 - Financial institutions



Development of Entrepreneurial Universities in Kenya senior managers in Saarland, Germany



Club Name: Chuka University Students' Club for UNESCO (CUSC-UNESCO)

Club Theme: Championing Academic and UN SDGS Excellence (CAUSE)

Subthemes (Areas) of participation and proposed activities focusing on SDG's/Vision 2030

- 1) Championing academic excellence and gender parity.
- 2) Empowering youth in gender parity and positive use of technology - SDGs 3, 5 & 9
- 3) Enhancing health lives through elimination of drug abuse. SDG 3
- 4) Championing environmental health [Litter-free environment, clean rivers and lakes] - SDG 6, 13 & 14
- 5) Engaging in music and art for peace inclusive and society.- SDG 16

Objectives

- > Recruit and establish membership of UNESCO Clubs.
- > Create visibility of UNESCO and the Kenya National Commission for UNESCO through this platform by dissemination of relevant UNESCO materials to all
- > Realize Kenya's Vision 2030 and SDGs in promoting peace and sustainable development (SDGs) through the UNESCO Clubs.

Expected outcomes

- ✓ Established UNESCO clubs which are sustainable.
- ✓ Enhanced visibility of UNESCO and the Kenya National Commission for UNESCO (KNATCOM)
- ✓ The use of the UNESCO club platform to promote SDGs pillars of Society, Environment and Economy.
- ✓ To gain global recognition.
- ✓ Opportunities for collaborations, consultancies and networks.

- ✓ UNESCO clubs are a global movements that fosters partnerships within communities with the aim of promoting and sharing UNESCO's ideals of peace, intercultural dialogue, eradication of poverty and sustainable development, and endeavour to make it known and associate themselves with its work by undertaking activities directly inspired by those of the Organization.
- ✓ The Clubs consist of groups of volunteers of all ages and diverse socio-professional background. These clubs support UNESCO priorities by using a community experiences, skills and outlook to foster peace.
- ✓ The UNESCO Club is a centre for lifelong education. It aims to get its members to think and to work with open-mindedness and an understanding of other people. A 'World Federation of UNESCO Clubs and Associations' was founded in 1981; its General Secretariat is located in Paris at UNESCO's Headquarters. UNESCO makes available to all Clubs, free of charge, publications of general interest about the Organization.
- ✓ National Commissions for UNESCO are responsible for ensuring that the Clubs keep to UNESCO's ideals and that UNESCO's name is not used to promote activities not in line with the Organization, such as profit-making or seeking personal interest. UNESCO Clubs are also expected to support a National Commission's work in UNESCO's Programmes in their respective countries. UNESCO Clubs are essential in the promotion of international co-operation and the ideals of UNESCO in the fields of Education, Science (Natural Sciences, Social and Human Sciences), Culture and Information & Communication. In Kenya, UNESCO Clubs currently are established in Primary and Secondary schools all over the 47 counties and already achieving a lot in the various fields.

Membership and Certification

Registration fees =Ksh. 100 once

Subscription fees =Ksh. 50 per semester

Activities undertaken so far

Launch: 26th February, 2019.

Walk: World Diabetes Day - 14th November, 2019

Constitution adoption: 22nd January, 2020



Chuka University Students' Club for UNESCO Leadership

Prof. Dorcas Isutsa - Patron CUSCU

Dr. Zipporah Wanjiku - Deputy Patron CUSCU

Dr. Grace Murithi - Liaison Officer CUSCU

Ruth Muturi: Student Counselor

Hellen Ngunyi: Student Counselor

President: Alex Ouma

Vice-President: Glory Nkatha

Secretary: Susan Muthoni Mbui

Treasurer: Raphael Mwalili



CHUKA UNIVERSITY STUDENTS CLUB FOR UNESCO (CUSCU)



UN SDGs Rallying Call "Leaving no one Behind"



INTRODUCTION

United Nations Educational, Scientific and Cultural Organization, (UNESCO), was created for the purpose of advancing, the objectives of international peace and of the common welfare of mankind.

'Since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed'

Chuka University has committed to contribute to the realization of the UNESCO aspirations .

OBJECTIVES

- Championing academic excellence and gender parity.
- Empowering youth to positively use technology.
- Enhancing health through elimination of drug abuse.
- Promoting a dirt-free/litter-free environment and clean rivers and lakes.
- Engaging in music and art for peace inclusive and society.

MEMBERSHIP

- Regularly enrolled Chuka University students.
- An active member - any member in good standing with the university and has registered as a member through payment of their registration and subscription fees.
- Associate members - non-students, who shall have all membership privileges except for the right to vote or hold office in the Club.
- Eligibility for membership or election to office posts will not be limited on the basis of race, sex, colour, age, religion, origin, marital status, physical or mental handicap, ancestry or medical condition, except as explicitly exempted in law

CUSCU Patron, Prof. Dorcas Isutsa with founding members



ACTIVITIES

UNESCO Holidays, e.g.,

World Diabetes Day

HOW TO PREVENT?

- HEALTHY & BALANCED EATING
- APPROPRIATE BODY WEIGHT
- MODERATE PHYSICAL EXERCISE (E.G. WALKING 30 MINUTES A DAY)

CUSCU Club president, Mr. Alex Ouma, leading the activity



CONCLUSIONS AND PROSPECTS

CUSCU is committed to advancing the ideals of UNESCO within Chuka University environs and beyond

ONGOING PROJECTS

- Plan – To engage with the local primary and secondary school students

Chuka University is ISO 9001:2015 Certified...



...Inspiring Environmental Sustainability for Better Life

LIST OF START-UPS

S/N	NAME	REG. NO.	MOBILE	IDEA DESCRIPTION
1.	Suzanne Chebet	AB3/30245/17	0799-240254	- Service industry SUZSTAR FOUNDATION - General supplies – SUZSTAR ENTERPRISES
2.	Felix Odhiambo	CB2/37140/18	0796-090751	- Newspaper around the University and its vicinity: INDEPENDENT LENS - Local coverage of newsworthy and feature stories in the newspaper. It cuts across the University and the society around.
3.	Phyllis Nkirote Joyce Mumbi Bilta Wambui	DB8/28634/16	0704-838211	RAISE-UP KENYA AGRONOMIC OUTLETS: 1. Supply cereals and vegetables to schools 2. Hay production in Ngobit, Laikipia County.
4.	Faith Isaac	EB3/43470/19	0725432005	UNISEK: A Marketing and education consultancy platform which links institutions of higher learning and the public providing quality information about an institution to their target clients.
5.	Robert Muli Mutua & Ruth Wambui Gichuru	BB3/33488/17 BB3/30882/17	0701-599515 0702-735355	Autumn Cosmetics: It is a cosmetic and salon business, planning to redesign to specialize in sourcing hair products directly from the manufacturer and distributing it around Chuka vicinity with an aim of offering quality affordable products.
6.	Geoffrey Ong'ondo Dennis K. Chepseba,	BB3/25705/16	0713-454881	KILICOM application system as a way to improve agricultural production, marketing and extension service delivery to farmers.

	Brian Kibiwot Kiptoo, Nicholas Onyando, Dan Masese			
7.	Mary Wanjiku, Vera Kwamboka, Antony Ngereki, Saif Kinyori, Simon Muiruri			WASOMINET
8.	Kelvin Mutrithi Gitonga	CB4/25946/16	0796531451	LAPS4HIRE: A business for lending laptops to students at a pocket friendly price. This shall help students who cannot afford laptops in executing their academic goals...as researcher, typing assignments as well as for weekend entertainment and then they return the laptop in time, alongside that shall be selling flash disks for the same since no one shall be allowed to put their personal content on the machines internal memory
9.	Cyrus Njuguna	BB5/41301/19	0727734194	Cozy App & Msafiri App: Provides real-time data about matatus so as to prevent time wastage at matatu stages and reduce traffics through controlling the number of matatus on the roads.
10.	Rhoda Mutwiri Karanja	CB/8/36258/18	0706-007914	INVESTORS COMMON POOL YOUTH GROUP: A self-help group. We focus on enhancing financial stability and building skills into business ideas. We issue loans among our members which brings more income to support our operations.
11.	Marion Jepkosgei	DBS/32293/17	0702-996139	THE ART HUB: A non-profit initiative; art is sold and the money solicited directed in raising set books for needy student cases. Basically instilling a reading and art culture on the society.

12.	Kenneth Mugambi Mutuma	ABS1/23036/16	0741-408787	KENNETH DAIRY BUSINESS FIRM: A personal initiative business plan idea. It entails Dairy Farming which is the most leading project that will help to bridge the gap of unemployment. I intend to do this profitable business in the near future.
13.	Bethwel Kibet	BB6/27092/16	0712726756	BIZMA ENT: Provides easily affordable insurance services to the low income persons within Mt. Kenya Region.
14.	David Onyango Oduor	CB1/31369/17	0723972458	Expanding Small Businesses and opening up business ideas to low income persons.
15.	Robert Waweru	BB53/29386/17	0791282295	Mushroom Production
16.	John Ndung'u	BB7/26198/16	0705172505/ 0717190964	Exec Landscaping: How landscaping sector has the capacity to protect the beauty of our environment, preserve nature and create order and as a small business in Kenya.
17.	Wilson Njuguna Gichuha	EB4/43519/19	0719305078	SOAP CARE ORGANICS: Soap making using natural products to make skin care and cosmetic soaps.
18.	Isaiah Ndirangu Njiri Dennis Wasenya Victor Ochichi	EB5/27824/16	0790662475	ISADEN INCINERATORS COMPANY: Making up of an incinerator in Chuka University.
19.	Pares Oketch Spondu Felix Kiptoo	EB1/316381/17 EBI/31507/17	0705-798540 0702-592652	Importation of computer and computer accessories
20.	Faith Wairimu Kamau	EB6/27164/16	0727-076219	Mathematics specialization and careers

21.	Kevin Otieno Stephen Ochieng	DB11/28455/16 DB11/28466/16	0792-867638 0712-570411	Whole green banana flour fortified Bread: Production of Bread fortified with green banana flour
22.	Victor Ochich	EBS/27823/16	0791-593870	Entrepreneurial: Mombasa Raha Sun Cruise Hotel
23.	Emmanuel Muthui Mercy Ndanu, Britney Joice	CBI/19481/15	0799-041018	-PENTA HEALTH: Diagnostic e-health app that aims at digitizing personal medical records and health services like online prescriptions using artificial intelligence -Digital biogas production and supply business targeting small and medium households. Purchasing biogas using your phone
24.	James Njenga	EB13/37552/18	0748-035196	- Digital marketing. - Visual graphics and Animations. - General Graphic Designing (Logos, Burners etc) - More for local televisions - Video Adverts.
25.	Ruth Wanjiru	ABSI/33731/19	0795-307715	AFRICANISM JEWELRIE: Bringing natural beauty in girls and women. Helping the target group appreciate their African beauty by incorporating the Africanism in Jewelries and women's stuff thus upholding their nativity.
26.	David Githinji	DB6/32380/17	0727-454780	Organic Fertilizer Using Fruit Peels (banana peel and orange peel). A case study of Tharaka Nithi County.
27.	Abigael Mwende Ndanu David Kithui Kamau	DB6/26574/16 DB6/33484/17	0729-017311 0771-026746	TAMU JUICERS: Extraction of natural gooseberry juice and value addition using garlic & honey as well as packaging.

28.	Andrew Ouko	CB16/41694/19	0792971152	Network Marketing
29.	Timothy Omwaka Sakwa	AB3/302306/17	0706107096	Branding and Marketing of Small Businesses
30.	Florence Nduku Katumo Katua Katuli Dominic Kipng'eno	DB6/27284/16 DB6/20959/15 DB6/27300/16	0707259117 0721566269 0715967613	VEGGIE HERO: Increasing the Shelf-life of vegetables and environmental conservation.
31.	Perminus Kaburu and Cyrus Njuguna.			COZY APP
32.	Ajona Warioba Kumba, Wilson Mwit Muthee, Jennifer Kibiri, Fidelis Waweru			AJOTRACK
33.	James Mwaniki, Millicent Moraa, Purity Wangari, Kelvin Mutua, Stephen Kioge			JEMCO Cleaning Agents
34.	Dorine Odhiambo, Kahendi Doreen, Naini Sharon, Kanana Doreen			DEEs Interior Décor
35.	Faculty of Humanities and social Sciences			CRAFTY SOULL

CHUKA



UNIVERSITY

Knowledge is Wealth/Akili ni Mali (*Sapientia divitia est*)

DIRECTORATE OF RESEARCH, EXTENSION AND PUBLICATIONS

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ASSESSMENT TOOL FOR START-UPS

Title of Project/ Innovation			
Name of Presenter(s)			
Faculty			
Department			
Type of Presenter (Tick One)	Student	Staff	
Evaluation Criteria		Scores	
		Scale (1-5, 5= Excellent and 1=Poor)	
Novelty/Creativity/Originality			
Problem or need			
Solution (Product or Technology)			
Practicability of the Solution			
Business Model			
Impact			
		Team	
Total Score			
Name of Assessor		Sign.	Date.
Reviewer		Sign.	Date

Description of the evaluation criteria:

Practicability: how practical is the application of the solution?

Quality of the presentation: Quality of slides? Clarity? Audibility? Logical presentation of ideas (flow)? Time management?

Target market: Clearly defined target market? Is large now or in future? Stable or high growth? Sustainability?

Problem or need: Problem/need is real? Fad/short term trends? Sustainable challenge, need?

Solution: Better, faster, cheaper? Brand? Quality? Efficient? Convenient? Unique? Price? Value prop? A potential to move from an idea to business?

Team: Industrial knowledge, unique skills, leadership, key relationships, prior successes and/or failures? Able to come up with team from diverse driplines?

Novelty/ Creativity/Originality: a new product/ process or idea? A new more efficient process for producing an existing product? Reduces the production time? The production cost or the environmental footprint of production?

Business model: How do they intend to make money from the solution?



Suzzanne Chebet

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Tel.: +254 (0)792121205

Email: suzannec0@gmail.com

Purpose of Suzstar Enterprises

- This is a registered sole proprietorship business that deals with supplies of dried cereals currently situated at Chuka University, Ndagani market.
- This is to aid in cutting down transport cost and reduce the distance of retailer customers having to travel all the way to Chuka town to purchase the same products, for about 50% of retailers.
- Doing delivery of products. This saves time for my customers of whom previously others had to close their businesses in order to go and purchase the products in town, which makes them waste time and at times lose customers.
- Providing quality products.
- Providing affordable products.

Cereals Sold at Suzstar Enterprises

- Red beans
- Yellow beans
- Rice, pishori
- Ndengu (green grams)
- Minji (Peas)
- Muthokoi (peeled maize)

SUZSTAR Enterprises Business Canvas Model

➤ KEY PARTNERS

Farmers (Producers)

Stores suppliers (wholesalers)

➤ KEY ACTIVITIES

Identifying suppliers.

Negotiating with suppliers about costs of purchasing the products.

Seeking relevant permit e.g. in schools.

➤ KEY RESOURCES

A Store

Operating capital

Human resource

➤ VALUE PROPOSITION

Affordable cereals

Quality products

Quality services e.g. delivery of products to customers

Consistent availability of products.

Packaging in terms of varying measurement of products e.g 2 kg, 1 kg, ½ kg and 1/4 kg

➤ CUSTOMER RELATIONSHIP

Direct marketing. e.g. giving discounts upon a customer purchasing large quantities of products.

➤ MARKETING CHANNELS

Using word of mouth

Use of fliers

Social media advertisement: Facebook @Suzstar enterprises and whatsapp groups

➤ CUSTOMER SEGMENTS

Hotels in Ndagani

Women selling boiled cereals

Shop keepers boiling cereals

Schools

➤ COST STRUCTURE

Store/house renting

Human resource

Transport cost

Purchasing capital for products
 Preservative chemicals for the products
 Proper storage
 Measuring tins.

➤ REVENUE STREAMS

Selling cereals at a profit to retailers
 Getting cereals from farmers directly and selling to other stores at a discount

➤ SOURCES OF REVENUE

Soft loans; KCB, Mpesa, Mshwari

PRODUCT	QUANTITY	BUYING PRICE (ksh)	SELLING PRICE (ksh)	PROFIT PER SACK (ksh)	TOTAL PROFIT (ksh)
Beans	2kg	150	180	30*40	1200
Ndengu	2kg	150	180	30*38	1140
Yellow beans	2kg	270	300	30*38	1140
Maize	2kg	80	100	20*38	760
Minji (Peas)	2kg	160	185	25*40	1000
Muthokoi	2 kg	80	110	30*38	1140

Sales Per Day

Least sales (bad day)

PRODUCT	QUANTITY	PROFIT PER 2KG
Beans	13kgs *30	390
Ndengu	10kgs*30	300
Yellow beans	8kgs*30	240
Maize	6kgs*20	120
Muthokoi	6kgs*30	180
Minji	12kgs*25	300

Profit Per Week

Kshs. $1,530 \times 7 =$ KSh. 10,710

Profit Per Month

Kshs. $10,710 \times 4 \text{ weeks} =$ KSh. 42,840

Profit Per Year

Kshs. $42,840 \times 12 =$ KSh. 514,080.

Limitations

1. Not all the entities (products) can be sold in a day.
2. A decrease in student population e.g. during long holidays makes the demand to lower hence reducing the sales.
3. Fluctuations of prices due to varying harvesting seasons lead to different pricing of products.

Recommendations

- Tender opportunities to students.
- Capital –funding my business will enable me purchase a business car or motorcycle (liability) that will help me go for cereals directly from the farmers and deliver products efficiently to different customers thus saving the business the cost of having to higher the above mentioned.
- Investing financially in my business will enable me expand my business by increasing the quantity of products to meet the increasing market demand.

INDEPENDENT LENS

TEAM

- *Felix Odhiambo* =CEO
- *Maxwell Amunga* =Chief Editor
- *Bildad Makori* =Sales and Marketing
- *Emmanuel Mwangala* =Public Relations

MEDIA PRODUCTION COMPANY

This idea is originally for Independent Lens and is not plagiarized from any other source.

CONCEPT

- Multimedia journalism.
- Quality Content creation.
- Advancement in story coverage.
- Allowing production and dissemination of silent stories back in the society that the mainstream and gutter press has forgotten.

PROBLEMS

- Untapped Talents
- Job Opportunities
- Dependency

SOLUTIONS

- Improvising media techniques in production – covering all news worthy and other stories from all people and angles thus attracting a larger audience.

- Offering Employment Opportunities.
- Enhancing skills and competency in media as a profession.
- Affordable access of information

BUSINESS MODEL

Since Independent Lens is a profit making organization, we are also focusing on being entrepreneurial through:

- Advertisements at affordable prices.
- Sales.
- Marketing
- Public Relations

MARKET

- Media consumers- general public
- Business personnel and other young entrepreneurs.

RAISE-UP KENYA AGRONOMIC OUTLETS

TEAM MEMBERS		
<i>Phyllis Nkirote</i>	DB8/28634/16	Managing Officer
<i>Bilta Wambui</i>	BBI/26253/16	Accounting Officer
<i>Joyce Mumbi</i>	DB8/28574/16	Marketing and Logistics Coordinator

Introduction

Raise- up Kenya Agronomic Outlets proposes to:

Near future: -Grow/sell hay for small-scale Rhode grass (*Chloris gayana*).

-Supply vegetables in major markets and later schools.

Long run: -Large scale hay farming and sell

-Supply cereals and legumes to locals and later institutions and markets.

Proposed Region of investment: Ngobit ward, Laikipia County. (LH4 - LH5)

Why the business ideas? Simple, affordable ventures, few investors because:

Hay	Vegetables, cereals, legumes
<p>Selling hay will help fulfill the consumer and producer demands. Ngobit Location= 1147 homesteads, 75% have cattle, 10% have hay fields, none does more than 3 acres, 1 cow = 1 bale, no fodder, riverine vegetation destroyed, cattle die or are sold in dry spells due to lack of fodder. Rhode grass is drought resistant , can be harvested twice annually, takes 90-105 days to mature</p>	<p>So as to supplement the capital of the proposed large scale hay production. Vegetables can be grown in zai pits along boundaries In every new acre of hay, Cereals and legumes can be intercropped with hay in the first season. Tenders can then be sought in institutions.</p>

Proposed budget for hay production (1 acre)

ITEM	ACTIVITY	QUANTITY	Rate	COST.
Land preparation	Ploughing	1	6000	6000
	Harrowing	1		3000
	Sowing	1 day		500
	On farm seeds.	3Kg		Available
	Hybrid seeds. (1kg)	1Kg	1000	1000
Weeding	Herbicides charges			1000
	Labour charges			600
	Top dressing (CAN)			3000
Harvesting	Labour charges			3000
				∑15,100

Fund Source

Main Advantage: Mechanical Knowledge will help cut costs. E.g. herbicide application, using organic manure.

Risk Involved

Risk	Mitigation measure
Flooded markets	Have durable storage mechanisms. Quality assurance to maintain consumers.
Delayed Payments.	Have Savings ready for that. Legal agreement with consumers.
Disagreements with consumers	Seek tenders.
Cereal and legume crop failure.	Maize, millet or sorghum fodder. Legumes play role of nitrogen fixation

Business Model

Transport

In case of private means calculations will be considered as per AA rates. (current is 40). Normal public transport rates.

For Hay

Total cost of hay: 15,100 + 10% contingency = 16,610

Yields: About 300 bales per harvest.

Harvest twice per year = 600 bales

Sales @ Ksh 200 per bale. (subject to fluctuation) = 120,000.

Net income: 120,000 – 16,610 = 103,380

Comparison with the Usual Maize Growing

90 kg bag of maize is 2,500 at NCCP

Production cost of 1bag Ksh 1,400

Net profit = 1,100

Total net profit from 1 acre = ksh 48,000

Maize is subject to failure in case of dry spells

Proposed Market and Marketing Strategies.

Short-term	Long-term
Local farmers: 1 cow/ 1 bale per day. In Ngobit location: 1147 households where 90% are subsistence farmers. Pasture on high demand in the dry season.	Better parts of: Laikipia County Nyandarua County Nyeri county



Team

- *NATHAN KAWANGA*
 - Founder and CEO of UNISEK
 - Director Wayd Foundation.
 - Degree- Business management; Finance and banking.
- *FAITH ISAAC*
 - Co-founder of UNISEK
 - Software developer. -Applied Computer Science.
- *BETTY WENDOT*
 - Ass.HR manager -Agricultural Development Corporation.
 - 20 year's experience.
- *ANTHONY MUSYOKA*
 - Business Commerce-Accounting.
 - Accountant- Kartasi
- *DR. JUSTUS MUSILA*
 - Chief Finance Officer at AIU.
 - PhD in Finance
- *GLADYS MALELU*
 - Director. -Trickle-up Kenya.

Statement of the Problem

- Insufficient and invalid information during a career choice.
- Lack/scanty proper career guidance.
 - Wrong career choices.
 - Change of courses and institutions.
 - Dropping courses.
 - Tarmacking after several years of study.
- Differentiation between universities making it hard for making a choice.
- Low capacity of market reached regarding an institution.

Solution

- UNISEK is an android platform based website and mobile app.
- Providing valid, detailed, and analyzed information about an institution and courses.
- Ensuring one's interests are matched perfectly.
- Inform about market trends of a certain career/course.
- Inform about the career flexibility of various fields.
- Minimum grade and cluster points required.

Business Model

- We recently acquired a Copyright certificate from KECOBO.
- Category: LITERARY: LT-015455
- Company Registration Application: PVT-PJUR92L
- Our target market includes:
 - Institutions of higher learning.
 - Students; High school students, Form four leavers, University students.
 - Public.

- Uniqueness of UNISEK:
 - Student’s preferences; Academic, non-curriculum, Environment.
 - Resource and article center.
 - Text bulking and email marketing.
 - Course and institutional analysis.
 - Direct marketing.

Business Model

- Institutions pay much to the media for advertisement:
 - Citizen TV – 400,000 in a month.
 - Hope TV-45,000 in about 2 weeks.
 - Standard digital-400,000 per day, 2hrs(video stream)

UNISEK CHARGE RATES

Where	First year		Next 5 years (30% interest)	
	Per annum	Per month	Per annum	Per month
Universities	250,000	20,833.33	325,000	27,083.33
Colleges	175,000	14,583.33	227,500	18,958.33
TVET Colleges	120,000	10,000	156,000	13,000

- Income generation:
 - 1) Institutional fee to market through our platform.
 - 2) Premium accounts subscription. -Market analysis of a career over a duration of time, Scholarships...

Conclusion

Some of the impacts arising from this include:

- Many people being comfortable and confident about their course/career.
- People making informed decisions based on valid information.
- Cost of marketing for an institution will go low.
- Student enrollment increment to institutions that perform best.

AUTUMN COSMETICS

Team

- ▶ *Robert Muli - founder*
- ▶ *Lucas Mwangi - marketer*
- ▶ *Ruth Gichuru - partner*
- ▶ *Eric Muguro - partner*

Problem

Following the unmet demand of synthetic hair products and poor services rendered in Ndagani area due to the increasing demand and the rapid growth of the target population which is approximately 10,000 comprised of both final consumers and retailers, we came up with an idea that would help fill the market gap.

Solutions

We intend to fill the market gap by:

- ▶ **Specialization**

Setting up a wholesale beauty shop that will be specializing in a synthetic hair braid that is highly demanded by our target market

- ▶ **Multiple Variety of Products**

Provision of a variety of beauty products to satisfy unmet customer demand

- ▶ **Marketing Strategies**

Pricing- such as: - penetration pricing that involves gaining a large market share and once the market is established the price is increased.

Psychological pricing with an aim of influencing the consumer emotionally rather than influencing.

Promotion by discounting prices based on quantity purchased and during the business cycles such as depression.

Place by establishing the business in a strategic location where the products will be readily available to the consumer.

► **Offering Delivery Services**

We would offer these services for free to the bulk buyers

Charge a small amount of fee for those who order small amounts

Business Model

Product	Buying price per piece in ksh	Selling price per piece in ksh (retailers)	Selling price per piece in ksh (consumers)	Expected sales per week	Buying cost	Total revenue
Braids	38	50	60	1000	3800	50000
Weaves	250-500	400-700	500-800	100	40000	55000
Crotchet	150-250	200-500	350-750	200	40000	70000
Wigs	600-700	800-1200	1500-2500	10	6500	10000
Total					124,500	185,000

Total Costs In Kshs Per Month:	Other expenses-10000
Buying costs-498000	Total: 539,000
Transport costs-8000	Total Revenue Per Month: 740000
Rent-8000	Profit Estimate: 201000
Salaries-15000	



KILICOM SYSTEM

Team

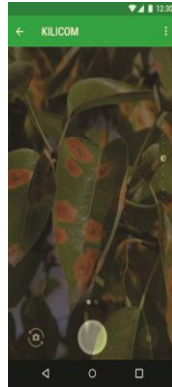
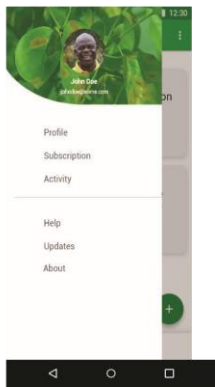
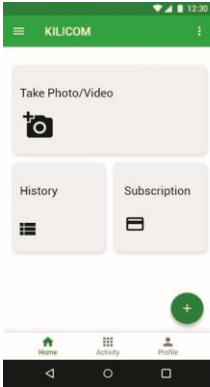
- 1) *Geophrey Ong'ondo- Team Leader.*
- 2) *Nicholas Onyando – Agribusiness Manager*
- 3) *Brian Kiptoo – Agricultural Economist*
- 4) *Brian Bett – IT Expert*
- 5) *Dennis Chepseba – Environmentalist*
- 6) *Dan Masese – Marketing Manager*

Problems

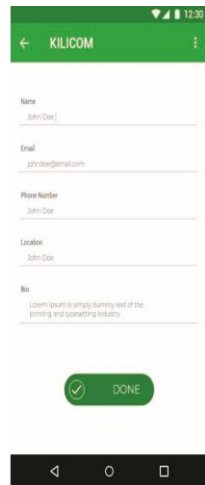
- The interactions of farmers and extension officers has been limited leading to decline in agricultural productivity at the farm level due to poor response to farmer's needs in real time resulting to inadequate food supply and unemployment.
- Farmers are faced with a problem of controlling pests and diseases in both crop and animal production combining with unavailable remedies which leads to poor yields in the long run
- The ratio of extension officer to farmer is estimated to be 1:10,000 meaning it is not feasible to reach out all farmers through conventional extension methods,
- There is disconnection between agricultural headquarters and field operations since most of the headquarters are located in urban areas, hence extensions officers do not frequently travel to the field leading to poor response to farmers' needs, innovation and implementation of production skills.
- Exploitation of the farmers by the brokers due to farm gate prices and lack of market information.

Solutions

By use of **software** that is **KILICOM application system** which **increases coverage** of agricultural officer on farmers' timeline, **penetration of agricultural knowledge** to the community and provides **market information** of all products and services as well as enhance **accessibility of extension services on timely basis.**



AppFlow | Tabs



Business Model

Market size: Currently we are targeting 5000 farmers in the second phase of marketing before the full adoption of the application by farmers, customers and professionals.

Target market: Kilicom targets all farmers, women and youths who are engaged in agricultural production as well as customers

How to earn: We will be charging a subscription fee of kshs.100 per month. Therefore, with our starting target members: $5000 \times 100 =$ KShs 500,000 per month. The system development fee costs KShs 225000. Thus, net profit estimate is KShs 275, 000, during the first month.

Market strategy: Due to the small number of available mobile agricultural apps in comparison to the great number of Kenyan people involved in agriculture shows that the supply of these applications are limited, Kilicom app is in a unique position to help digitally transform agriculture by use of smartphones, tablets, laptops etc.

We also intend to partner with agricultural firms to help increase efficiency in production and monitoring their farms well by ensuring timeline response to farming challenges like pest and diseases. Also provide market information to farmers, manufacturing firms and consumers to reduce price discrimination or exploitation.

To propel the system to the society very fast we will conduct advertisement, training of farmers and organizing workshop for the awareness to increase use of Kilicom (**simple timeline farming and marketing reach out**)



Team

- *Mary Wanjiku* -*Concept Designer*
- *Vera Kwamboka* -*Content Manager*
- *Antony Ngereki* -*Project advisor*
- *Saif Kinyori* -*Technical lead*
- *Simon Muiruri* -*System developer*

Problem

- 1) Developed and developing countries such as Kenya heavily relies on a system of consumption and production based on intellectual capital. This is to mean that to gain competitive edge product and services must be capitalized on scientific research and basic applied research.
- 2) In the current economy research is dumped in archives, repositories.
- 3) We also have people who have the know-how but they don't know where to apply it. On the other hand, we have people industries and companies who have problems but they do not know what to do or who to contact

Solution

Wasominet is an answer by linking the knowledge owners to companies which are looking for the know-how. (Company can also be an individual). Wasominet provides a platform where even researcher can have a real time chat over this platform. This will allow multi-institutional collaboration/research echoing SDG17 (Partnerships to achieve the Goal).

<https://wasominet.com/>

LAPS4HIRE
Your cyber home

Presenter: Kelvin Gitonga

MISSION

To ensure smooth learning through enhancing computer skills and introducing students to the global community

VISION

To inspire students to learn more

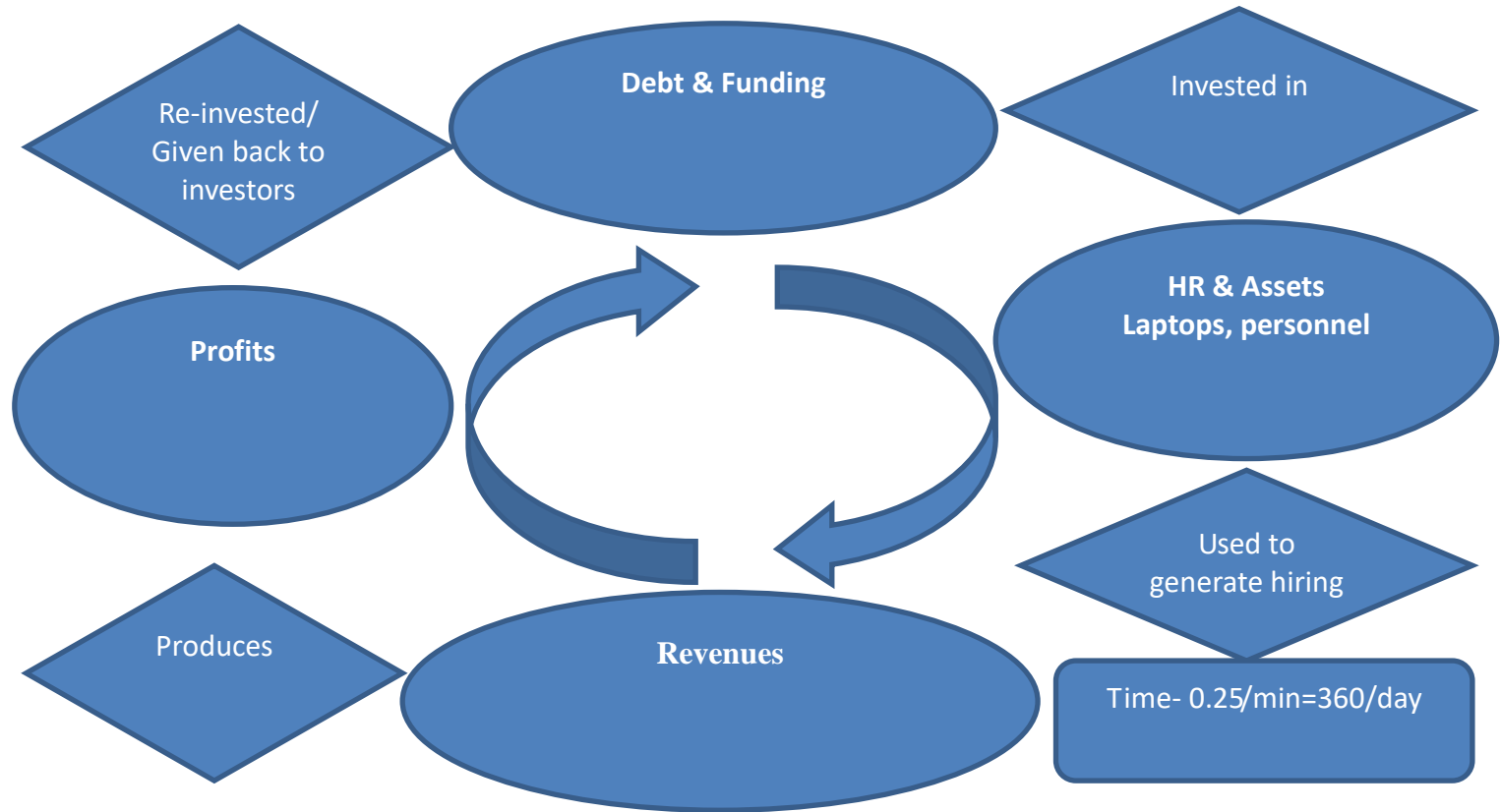
UNIQUENESS

- Laps4hire is a mobile cyber (you can have the services at the comfort of your room)
- Its 4 times cheaper than a stationary cyber
- It shall give clients ample time with the machines to learn
- Shall have a weekly challenge in learning computer skills (free) e.g. How to design presentations
- Shall incorporate the virtual DJ to help students familiarise with Deejaying
- Shall include Sports gaming eg the FIFA football which is a common recreation among students

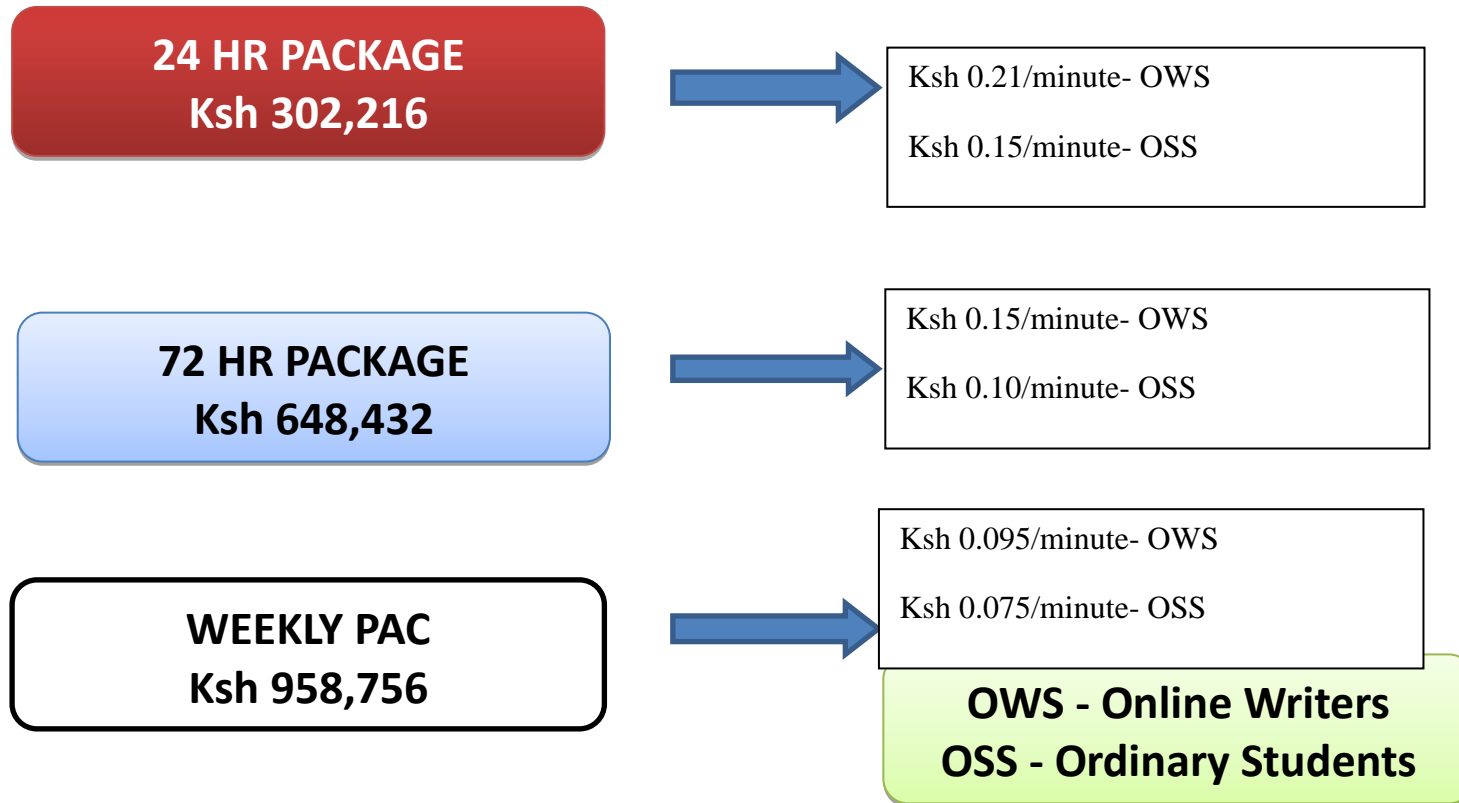
THE PROBLEM

- There are students doing online writing but do not have the laptops to undertake the task. They need laptops to do the task
- Many students in institutions of higher learning in our so called “third world” countries do not afford laptops to enhance their academic pursuit. The only available option is to sit down and get glued in a cyber with limited time and paying dearly for it which is a challenge to students. There is no ample time with the machine to research and explore

THE BUSINESS MODEL



SERVICES



TARGET MARKET

- Immediate target market. Students doing online writing and the laptops are not enough, if given the capital I just purchase the laptops and hire them directly
- The main market for LAPS4HIRE shall be the student population around campuses and other institutions of higher learning since most of them hail from humble backgrounds thus don't have the ability to procure gadgets such as laptops
- It is also the safest due to partnerships with the institutions

THE TEAM





FINANCIAL PROJECTION AND LOGISTICS

- **SOLE PROPRIETOR**

Fixed capital – ksh 100,000. No need for a room

Procure 5 Laptops

Dell latitude 2120 1@Ksh 19850

Given 1m I would start as a company

Procure 30 laptops

- **REVENUE GENERATION**

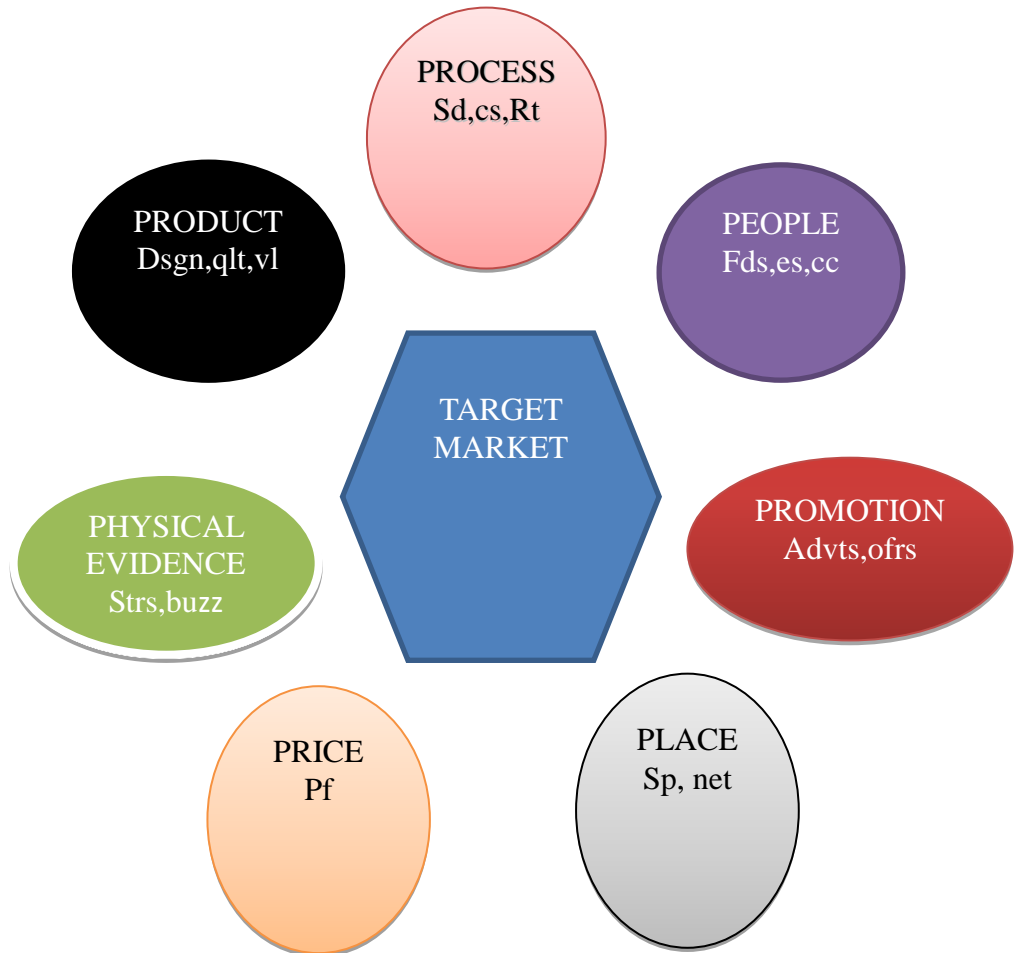
Charge: Ksh 0.25/minute

Number of assets 5

$5 \times 0.25 \times 60 \times 24 = 1800/\text{day}$

$1,800 \times 30 = 54000/\text{month}$

MARKETING STRATEGY



MSAFIRI APP

Presenter: Cyrus Njuguna

PROBLEM

- Chaos in the transport system in terms of pickups at stages

SOLUTION

- Provide a way to know when a matatu will arrive at a certain stage and to be able to book a seat at the comfort of your own home.

BUSINESS MODEL

MARKETING

- Allow free app downloads.
- Target institutions of higher learning across the country [creating awareness of the app.]

HOW I EARN

- I charge per passenger who boards using my app an agreed upon percentage price.
- After gaining footing I charge for uploading a Sacco into my app [the total revenue should be more than 20% the cost I per took to develop the application.]

INVESTORS COMMON POOL YOUTH GROUP

Team members

- ▶ *Joseph Kinyanjui*
- ▶ *Rhoda Muthoni*
- ▶ *Gideon Bett*
- ▶ *Amos Mutambu*
- ▶ *Dorcas Muigai*
- ▶ *Jackline Wanjiku*
- ▶ *Shadrack Langat*
- ▶ *Emmanuel Korir*
- ▶ *Jedidah Chebet*

Vision

Bridging the gap between the rich and the poor

Mission

Provide a conducive environment for investment, enhance integrity, nurture talent and skills and foster general development to realise financial independency

EMAIL: youninvestorscommon19@gmail.com

TEL: 0706007914

OBJECTIVES

- ▶ To provide financial assistance to members of the group and society at large
- ▶ To promote financial self-reliance
- ▶ To nurture skills and talents

- ▶ To promote unity in the society
- ▶ To enhance entrepreneurial culture
- ▶ To enhance integrity

KEY ACTIVITIES

- ▶ Multi-purpose detergent making
- ▶ Giving loans to members
- ▶ Cake baking

SOURCE OF FUNDS

- ▶ Membership registration fee
- ▶ Monthly subscription fee
- ▶ Interests from loans
- ▶ Fines
- ▶ Income generating projects i.e making detergent

VALUE PROPOSITION

- ▶ Affordable detergent
- ▶ Delivery chain
- ▶ Quality detergent

CUSTOMER SEGMENTS

1. STUDENTS

- ▶ Price conscious
- ▶ Trend followers

2. INSTITUTIONS (I.E. SCHOOLS, HOSPITALS) AND HOTELS

- ▶ Price conscious

- ▶ Large scale shoppers
- Mostly within Chuka

CHANNELS

- ▶ Whatsapp
- ▶ Facebook
- ▶ Word of mouth
- ▶ Posters

REASONS FOR SUCCESS

- ▶ Affordable
- ▶ Fast production capabilities
- ▶ Constant new friends
- ▶ Attending career forums

THE ART HUB

Presenter: Marion Jepkosgei

Mission: Raising Set Books for Needy Students

The Products

- The Gilder: Magazine Series
- Online Content (Blog): (The Writers Guild Chuka Website)
- YouTube Channel (Vlog)

Traction

- Three successive issues of The Gilder Magazine Issues.
- Establishment of the Writers Guild Chuka Website and correspondence blog.
- The Set Book Donation initiative - Ndagani Secondary School Model



The Problem

- Problem 1: Kenya is a poverty-stricken country. Many children struggle to go to school, let alone afford set books and text books.
- Problem 2: Art in Kenya is an underrated expertise and it has for years remained the most unpriced resource.

- Problem 3: While Writers Guild Chuka strives to refine the passion of art into profession at the same time tries to help needy students enjoy their basic right to education, we're crippled by insufficiency of funds, partners and equipment.

Business Model

- Business Entity: Writers Guild Chuka
- Type of Business: Partnership
- Nature of Partnership: All bona fide members are partners; Contributors to blogs and magazines are subject to profit and cost sharing; Sponsoring partners are entitled to profit as per their contribution.
- Profit: 50% of net income earned from the magazine sales, vlog and blog advertising income.
- The Charity: 50% of net income is channeled to the charity initiative (Set book donation).

Team: Marion Jepkosgei

WGC Leadership

Photography

Website Design

Video Editing

Graphic Design

Content Supervision

Market

- The main market for The Gilder Magazines will be the Chuka University Fraternity and Tharaka Nithi County at large.

- The online content will target audiences from all walks of life, both locally and internationally.

What new are we bringing to the market?

- Original fine art.
- Authentic, thoughtful articles from the minds of the young.
- Raw poetry, spoken word and ushairi videos.
- A chance to participate in touching lives.
- Latest news about Chuka University and its environs.

Conclusion

Our business idea is not profit oriented, but aims at touching lives by donating set books to needy students while keeping art alive and providing a livelihood to students who really need a source of income in campus.

“He who wishes to secure the good of others has already secured his own”

~Unknown

KENNETH DAIRY BUSINESS FIRM

Team

*I.T Expert for recording data, production of films, fliers and also producing advert: Name: **Evans Kinoti***

*A market: Name: **Kenneth Mugambi***

*Animal scientist expert. Name: **Martin Koome***

Nutritionist:

Motto: No Farmer, No Life, No Food.

Objective: Effective, efficient and consistence supplier of milk products.

Problem and Solutions

Creation of employment for youths.

Address the issue of food insecurity

Address the issue of inconsistent suppliers

- Effective, reliable and consistent supplier of milk products.
- Welfare package
- Address the issue of high prices of milk products
- Value addition of my products.

Business Model

Products packaging: my packaging will be environmental friendly; they can be re-used.

Products costs: The cost of purchasing my products will be low because of using locally materials thus reducing cost of production

Fixed prices conforming with the needs of the customers/clients.

Partnering with insurance companies: for instance, Majani Sacco,

Payment model

Target population and the size

- Population size ranges between 2000-20000
- Target customers will be super markets, retails shops, general shops, hawkers and everybody needs my products.

BIZMA ENTERPRISES
(BIASHARA YAKO BIMA YAKO: KILA MTU KILA PLACE)

Presented by: Bethwel Kibet

Aim

To empower and build capacity of economically active low income earners, women, PLWD and youth by providing training in business and financial management skills and a Revolving Fund.

Objectives

- To achieve the universal healthcare to all our clients through the insurance cover provided for by the enterprise
- To extend a Revolving Fund to members of the local low income earners, PLWD, youth and women of the economically active (Bankable persons) in the age of 18 – 60 years old, so as to empower them engage in income generating micro projects and businesses for their families.
- To channel at least 90% of the Revolving Fund to economically active persons, women groups and youths with income not exceeding Ksh 15,300/= or US \$ 150 per month.
- To mobilize and motivate the rural economic poor people set up self-help income generating projects by training them in entrepreneurial and business skills.
- To liberate low income earners persons from economic bondage / dependency, poverty and from marginalization so as to liberate them economically so as to improve their standard of living.

BACKGROUND

- BIZ BIMA ENTERPRISE will provide Basic training education and Functional Adult Literacy and Credit extension so that under employed and marginalized person, youth and women can create or expand Micro Businesses they plan and manage themselves to generate income for their families / households.
- The Capacity Building and Revolving Fund Programme is based on the assumption that these low income earners already have the capability and ingenuity (business idea) to create viable microenterprises. With the BBE start-up capital and training, they can make this potential a reality.
- The BBE Revolving Fund Programme also emphasizes strengthening business skills so that entrepreneurs are better equipped to sustain and expand their micro businesses.
- BBE funded businesses will be based on products or services that people know how to make or do, for which there are local markets.

THE BBE PROPOSITION/LENDING METHODOLOGY

- At least 15% of the required loan should be saved before loans applied for are processed and disbursed to the groups/individuals. Business counselling and training will continue throughout the loan term provided by Group Mentors and Field Officers.
- The enterprise will teach /train the women, youth and persons groups how to make small savings every week and acquire financial discipline for a period of 4 to 8 weeks in order to accumulate 15% of the required loan.
- Credit will then be extended to the project beneficiaries.
- This savings therefore will provide some level of security to our program for the loans and are therefore caveated by our organisation

during the loan period. Hence keeping in line with the best practices in the Micro-Finance Industry.

Conditions to be obtained under our Credit Extension program:

1. Ownership: The beneficiaries identify and plan the businesses themselves.
2. Local Resources: They secure savings / local necessary resources i.e. at least 15% of the required loan as their savings and as own equity.
3. Time and Energy: They each work a minimum of 6 hours per day on their micro-businesses.
4. Self-sufficiency: They anticipate a profit.
5. Reinvestment: They invest at least 20% of the profit in the enterprise.
6. Growth: They anticipate a continuing and expanding level of Self-employment.
7. Domestic consumption: They use at least 30% of the net profits into buying and providing nutritious foods and a balanced diet to their children / families/households.

Accountability

- They report on their businesses and its results.
- The loan beneficiaries submit a business plan which is first appraised at group level before being sent to our enterprise for appraisal before receiving the first cycle of loan of Kshs 20,000.00/=.

- They receive the second cycle of loans after submitting a business report, which demonstrates that they have kept records, have established viable enterprises and met program requirements.

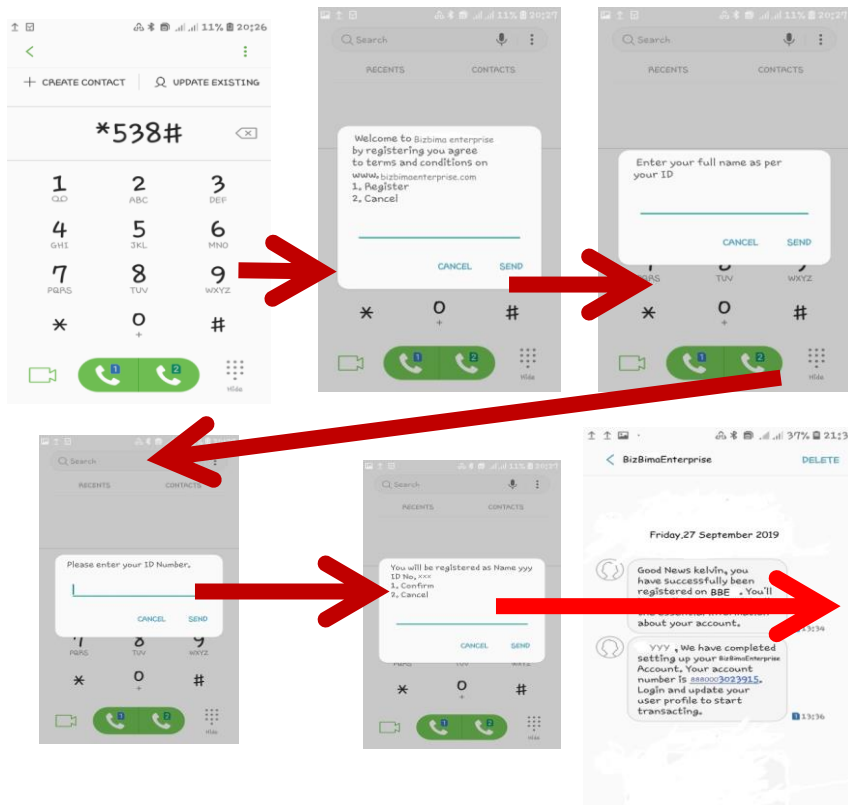
- The clients continue to save in order to qualify for the next higher loan in the next cycle and with each saving a 2% per the amount will cover their health insurance.
- Loan periods vary from 2 weeks, 1,2,3 or 4 to 6 months. Minimal flat interest rates of 9% per 2-weeks period and a18.5 % per month is charged on the loans to enable the programme meet its operational costs and to address the need for sustainability strategy and expand its capital base to serve more clients.

Customer Journey - Enrolment Process:

1. MANUAL/PAPER ENROLMENT

Basically, filling a detailed application form

2. DIGITAL/ONLINE ENROLMENT



- Safaricom PLC
- Saccos

Key Activities

- Investments
- Customers' savings
- Loaning of customers
- Insurance of customers
- Training of customers e.g. financial training, business management and entrepreneurship

Key Resources

- Finance
- Software developer
- Trainers
- Marketers

Cost Structure

- (Both fixed and variable costs)
- Training costs
- Administration fee
- Insured claim processing

Value Proposition

- Provision of insurance cover to SMES
- Financial literacy
- Loans and savings platform

Customer Relationships

- Effective communications
- Quality customer service

Channels

- Digital advertisements
- Direct marketing
- Customer referencing

Customer Segments

- Low income earners
- Small business owners
- Youth
- Women
- PLWD

Revenue Streams

- Customer direct savings
- Investments
- Loan interest

BIZ-BIMA Enterprise

- We are therefore providing a **more;**
- ✓ **superior**
- ✓ **sustainable**
- ✓ **unique**
- ✓ and **EXTENSIVE**, business oriented services

- Product/Platform **to** be embedded on their phones which they will access easily and easier way of insurance claim mechanism.
- The more one saves the amount of insurance cover increases.

How to Calculate the Loan

- At least 15% of the savings

$15/100 * 20,000 = 3,000$ of savings

For a group of 5 members

$20,000 * 5 = 100,000$

Interest = $18.5\% * 20,000 = 3,700$ per member

Why an added 0.5% in the interest?

-To cater for application fee and also for revenue increment

MUSHROOM PRODUCTION



Problems

Lack of enough supply of Mushroom in the market.

Inadequate Social Media Marketing strategies.

Lack of employment to rural peoples

Solutions

▶ Use of BIZ TECH Mush App to inform famers on.

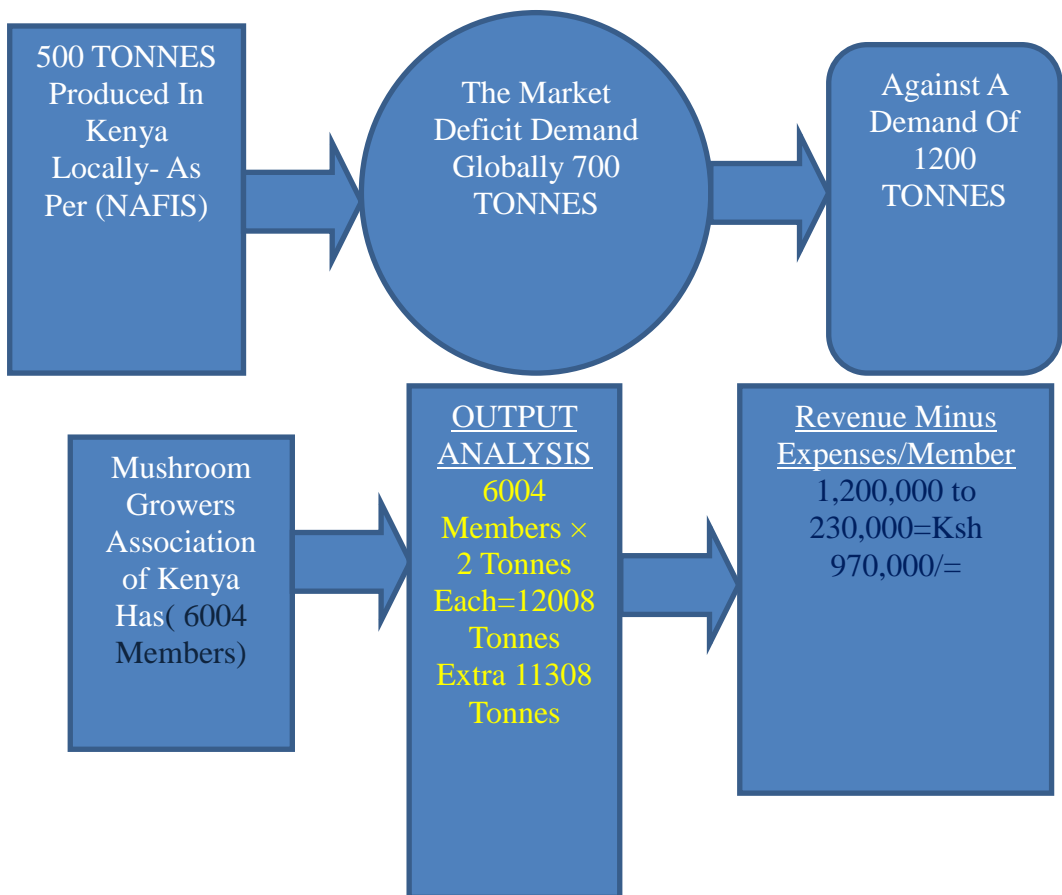
- ▶ Production Technology.
- ▶ Marketing Trends.
- ▶ Pricing Strategies.
- ▶ Demand and supply.
- ▶ Financial Support.
- ▶ Transport Logistics.
- ▶ Joining MGAk



Transaction Benefit to CEO Founder: Commission of 5% of every transaction made by the customer.


Business Model

According to the latest report, the Kenyan mushroom market is set to grow in value from \$35.08bn this year to \$59.48bn in 2021 due to advancements in packaging technologies to increase shelf life of mushrooms apart from consumer knowledge.



Social media marketing strategies - Facebook/Whatsapp/Twitter/YouTube/BIZ TECH MUSH APP.

Team

 A photograph of Robert Waweru, a man with short dark hair, wearing a white shirt and a dark jacket. He is sitting at a desk in an office, looking towards the camera. There are several monitors and papers on the desk.	<p>Robert Waweru C.E.O Founder Marketer Very, Innovative in growing the business and effective customer response</p>
 A photograph of Jack Munyi, a man with short dark hair, wearing a dark suit jacket over a light-colored shirt. He is standing outdoors in front of some greenery, looking directly at the camera.	<p>Jack Munyi Managing Director/Marketing/Accounting. Does Positive negotiation skills in selling the products abroad.</p>
 A photograph of Mrs Naomi Njoki, a woman with dark hair, wearing a bright pink dress. She is standing outdoors in a garden or park setting, looking towards the camera.	<p>Mrs Naomi Njoki HR/Logistics/ICT Does all the best by being the product ambassador and organizes meetings for performance valuation.</p>

EXEC LANDSCAPING

Presenter: John Ndung'u

Email: execltd662@gmail.com

Phone number +2540705172545 or +2540717190964

Motto: Together we make it happen!

Vision: To be the premier landscaping company in Kenya.

Problems

1. Soil erosion
2. Standing water
3. Lack of privacy
4. Lack of order
5. No beautiful landscapes



Products we offer

- Architectural services
- Grass & Flower seeding, planting and lawn maintenance
- Flower containers
- Red soil
- Wallpaper installation
- Making interior & exterior stools & tables from recycled products.

Our Target Market

1. Recreational gardens and parks.
2. Institutions of learning e.g. universities, colleges, high schools.
3. Individual people's homes.
4. Religious institutions.
5. Real estates.
6. National & county Government.

Our Competitive Advantages

- Use of machinery to deliver quality and smart work e.g. hedge trimmer.
- Serving low & middle class persons, ignored by large companies.
- Good location in Kiambu County.
- Low prices for high quality products.
- Recycling of waste products like old tires & used paint containers.

Finance

- We earn a profit of 40% of every sale we make.
- Average pay 2,000 by 40 clients=80,000
- Profit =32,000
- If we would invest 900,000 we can earn 1.2 M every year. (200,000 @ two months)
NB. For maintenance work only

Exec landscaping examples



SOAP CARE ORGANICS

Presenter: Wilson Njuguna Gichuha

Email: wilsongichuha@gmail.com **Telephone:** 0719305078

Partners

- Betty Industrial Chemicals limited
- Kenya Cosmetics Company limited

Problem to Solve

- Over 40% of people in our society have skin problems they are panicking to get a solution for like acne, pimples, dark spots etc.
- Untapped market for affordable family bathing and skin care soaps



Solution

- 1) Using natural active ingredients with curative and skin care properties in soap production.
- 2) To make cheaper long lasting family bathing soaps.



Carrot



Papaya



Tumeric



Aloe

Business Model

- Cost of production of a 300 grams soap =27-30 Shillings
- PRODUCER SELLING PRICE =55 Shillings
- Consumer price =60-65 (which is a fair price)
- With a soap plodder machine (costing 350 000)
- PRODUCTION =15-20 dozens/hour
- 1 day=180 dozens 118800 3,564,000
- POFITS 45%
- **Capital needed =500,000**

ISADEN INCINERATORS COMPANY

*Proposed by: Isaiah Njiri Ndirangu
Denish Ouma Wasenya
Victor Odhiambo Ochich*

PROBLEMS

- It is significant to appreciate the fact that in Kenya as well as other developing countries, solid waste is mainly collected and disposed in open dumpsites.
- Poorly maintained equipment and inefficiencies in road design and urban settlement in informal settlements also impede effective waste management.
- Super pollution in process of curbing environmental pollutions through incineration
- Additionally, lack of sufficient funds to finance awareness campaigns to encourage waste minimization at source along with minimal workforce impede efforts to achieve this vision.

- The impacts of waste on the environment, especially non-biodegradables such as plastics cannot be overstated. Land quality is compromised by presence of wastes. Both terrestrial and marine lives are threatened by presence of wastes. Blocked drainage systems and overflowing/burst sewers are sources of diseases that wreak havoc on human health with abandon. The consumer is paying heavy medical bills for diseases which would have been kept at bay if wastes were properly disposed.

JUSTIFICATION AND SIGNIFICANCE (SOLUTION)

Most regions coupled with the different agricultural farms, rapid domestic, commercial and industrial and health care provision activities means that hazardous waste production is on the great rise that require a cost effective national waste disposal infrastructure that can enable them to account for their chemical wastes and other hazardous wastes. This ISADEN incineration services is hence a necessity.

ANTICIPATED IMPACTS

- The facility is a blue print of country's vision 2030 aimed at having a clean and healthy environment for all. It also encourages private investments in environmental conservation within the country
- Cleaning up of hazardous and toxic materials from the agricultural sector and particularly the agro-chemical manufacturers and dealers as well as major users such as to include expired chemicals, packaging materials and obsolete equipment,
- Provision for disposal of expired drugs and medicines from hospitals and health centers across the institution, county and country as a whole, most of whom do not have a professional mode of the waste disposal,
- The facility will provide a safe point for reducing the volumes of hazardous waste and toxic wastes before disposal into appropriate county's landfills, most of which currently is dumped into public garbage disposal sites with adverse implications to the ecology and human health.
- The facility will provide a multiple of direct and indirect employment opportunities.

OBJECTIVES

- To curb super-pollution resulting from conventional incinerators
- To investigate the actual state of waste management.
- To identify and evaluate methods of waste management.
- To identify barriers to effective waste management.
- To identify and propose future sustainable waste management strategies.

CUSTOMERS

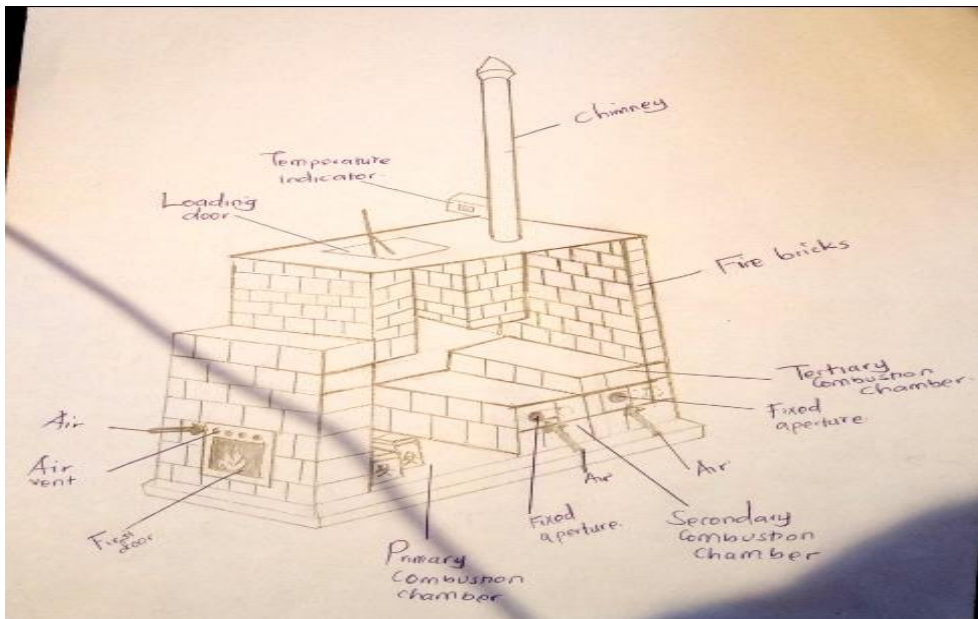
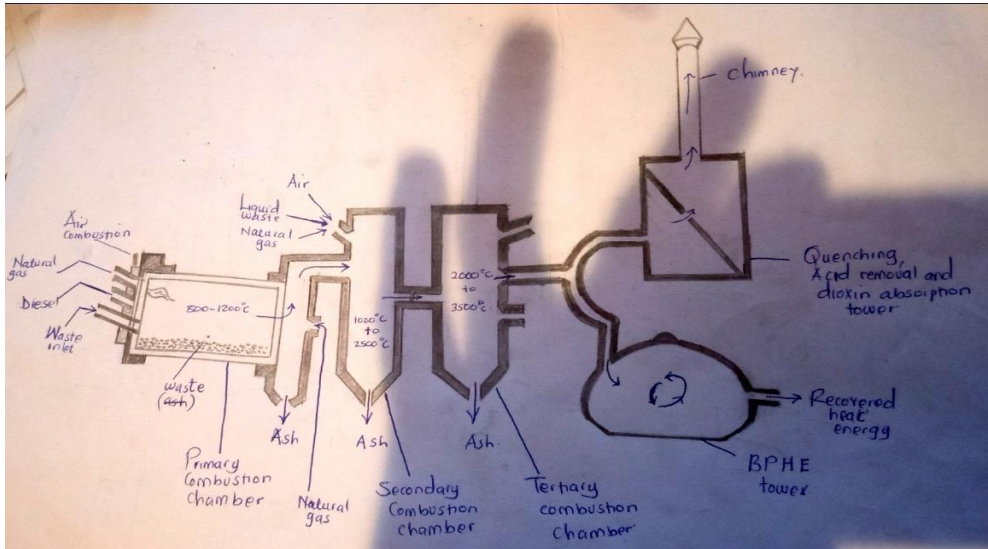
- ❖ Private and public health facilities
- ❖ Medical research institutes
- ❖ Universities
- ❖ Private and public industries
- ❖ Pharmaceutical companies
- ❖ Livestock research institutes
- ❖ National and County governments
- ❖ Agricultural research institutes

IMPLEMENTATION

- Funds
- Sensitization on need for sustainable environment
- Marketing

MODEL

ISADEN incinerator



SPECIFICATIONS

- General purpose
- Capacity (varies)
- 1° combustion chamber (ash + flue gas)
- 2° combustion chamber (flue gas)
- 3° combustion chamber (increase residence time)
- Automatic wet scrapper
- Heat exchanger (WH-HWH exchanger-**soft water**)
- Semi dry quenching tower (cooling effectively suppressing dioxin regeneration)
- Dry acid removal and dioxin absorption tower (further exhaust gas purification)
- Heat recovery tower (brazed plate heat exchanger-BPHE)
- Biodigester (methane gas)
- Diesel + natural gas hybrid incinerator
 - Premixed charge, diesel pilot ignition, natural gas/diesel dual fuel
 - High pressure direct injection of natural gas

COST SUMMARY

The total cost summary adds to 2,369,138 Kenya shillings only as detailed in our quotation.

CAPITAL SOURCE

- ❖ Investors
- ❖ Grants from environmental management agencies
- ❖ NGOs
- ❖ Private capital and assets

MARKETING STRATEGIES

- ✓ Market analysis
- ✓ SWOT analysis
- ✓ Defining target audience
- ✓ Developing positioning and messaging
- ✓ Create product message
- ✓ Choosing a pricing strategy

QUOTATION FOR CONSTRUCTING AN INCINERATOR 2018

ITEM	ITEM DESCRIPTION	QTY	UNIT	RATE (KSH)	AMOUNT (KSH)
1	INCINERATOR	76	SM	50	3,800
A	EXCAVATION AND EARTHWORK	66	SM	250	16,500
B	SITE PREPARATION	11	CM	100	1,100
C	Clearing site vegetation, grubbing up roots	22	CM	250	5,500
D	and filling up voids left with selected	14	CM	500	7,000
E	excavated materials	76	CM	400	30,400
F	Return and ram selected demolished material cart away from site surplus demolition spoil away from site				
	EXCAVATION				
	Load up and store on site, later level and spread as directed on site and cart away surplus excavated material				
	Excavated surface to reduced level				
	Over 300mm deep				
	Excavating Trenches; to receive foundation starting from reduced level				
	Not exceeding 1.5 M deep				
	Breaking out existing material, extra over all kinds of excavation irrespective of the depth				
	Extra over excavation for excavation in Rock class 1				
	DISPOSAL				
	Excavated material, backfilling, depositing and compacting in layers maximum 150mm thick				
	Carried to collection page				64,300
2.	DISPOSAL OF WATER	22	ITEM	30,000	30,000
A	Labour and material, keeping excavation	64	ITEM	20,000	20,000
B	free from general water	64	CM	1800	39,600
C	PLANKING AND STRUTING	12	SM	900	57,600
D	Labour and materials to hold the sides of	6	SM	175	11,200
E	excavation generally	47	SM	500	6,000
F	HARD CORE FILLING	65	SM	11,000	66,000
I	250 mm thick and depositing and		SM	240	11,280
J	compacting;		SM	1,500	97,500
	Approved hardcore material in making up levels well compacted				
	MURRAM				
	Blinding surfaces of fill 50mm thick				
	ANTI TERMITE AND HERBICIDE TREATMENT				
	“Gladiator TC” (Organophosphate Chlorpyrifos-covers 8 SM per litre as ‘HIGH CHEM LTD’)				

	To surface of fill and tops of foundations walls CONCRETE WORK IN-SITU CONCRETE, REINFORCEMENT Plain mix 1:4:8 in foundation strips blinding 50 mm Normal: Class 20/20mm; vibrated (1:2:4) REINFORCEMENT Reference A142;mesh 200*200mm weighing 2022kgs per meter (measured net-no allowances made for laps) 100mm thick fire clay brick as the base of the incinerator				
	Carried to collection page				339,180
K	SAWN FORMWORK TO IN-SITU	145	LM	400	58,000
L	CONCRETE	25	SM	180	4,500
M	Edges of floor bed 70 to 150 mm wide	135	SM	1,500	202,500
N	Sides of foundation strips and steps;	45	SM	1,400	63,000
O	horizontal	16	SM	13,000	208,000
P	WALLING	2	ITEM	7,500	15,000
Q	Double wall of 110mm of fireclay bricks built to approval Horizontal, 1NO of layer(s) over 300mm wide LINTEL REINFORCEMENT 150 X 230mm reinforced concrete beams (class20/25) to support bricks above. ROOF COVERING(INCINERATOR) 40 X 100X 5mm MS Channel section on top frame with a 30 x 30 x 3 mm MS Loading door with a handle on top 30 x 30 x 3 mm MS Steel opening complete with accessories	2	NO	4,500	9,000
	Carried to collection page				560,000
A	SUPERSTRUCTURE (WORKING	SM	24	1,500	36,000
B	ROOM)	CM	5	13,000	65,000
C	WALLING	KG	75	150	11,250
D	Masonry walls bedded and jointed in	KG	19	150	2,850
E	cement and sand (1:4) mortar in:	SM	6	400	2,400
F	200mm thick walls reinforced with	SM	25	1,500	37,500
G	32X2mm hoop iron every alternate course.	SM	30	180	5,400
H	Ring beam Concrete class 20/20 for Ring beam Reinforcements High yield reinforcement bars Y12 Y8 Formwork	SM	47	240	11,280

	Sawn formwork for lintels Vibrated reinforced concrete class 20/20 mm in:- 125 mm Thick floor slab Sawn formwork to: Edge of floor bed 75-150 mm high Reinforcement Fabric Mesh reinforcement Fabric mesh reinforcement to B.S.4483 ref: A93 weighing 2.22 Kg per square metre in floor slab(measured net-no allowance for minimum 230 mm laps) including tying wire and supports as required				
Total for walling carried to summary					171,680
	ROOF CONSTRUCTION (FOR WORKING ROOM) <i>The following in assorted timber trusses hoisting and fixing in position 2500mm above ground include all necessary jointing.</i> 100x50 Rafters (top member), and tie beam 100X50 Struts Purlins 75X50 Purlins Wall Plate 100X50 Wall plate Fascia Board 200 x 25 Fascia board IT4 Sheets:- 28 gauge roof covering sheets fixed onto timber purlins 8' X4' Weld mesh 16 gauge	24 12 30 30 30 30 47	LM LM LM LM LM LM SM	300 300 200 300 250 700 500	7,200 3,600 6,000 9,000 7,500 21,000 23,500
Carried to collection page					77,800
	Paintings; 3 coats white bituminous paint Render surface external for all M.S. plates	84	SM	350	29,400
Carried to collection					29,400
	Brought forward from page 1				64,300
	Brought forward from page 2				339,180
	Brought forward from page 3				560,000
	Brought forward from page 4				171,680
	Brought forward from page 5				77,800
	Brought down from above				29,400
Carried to collection page					1,242,360

WHOLE BANANA FLOUR FORTIFIED BREAD

Food Technologist: Otieno Kevin

Business promoter: Ochieng Stephen

Agriculturalist: Martin Nyaga

Mechanical engineer: Eunike Bett

Problems

- Wheat deficiency in Kenya (Kenya imports 1.6 million tones; Russia, Argentina, Ukraine, Canada, Latvia).
- Postharvest losses of ripped bananas.
- Malnutrition e.g. celiac disease, Chronic diseases (diabetes type 2)
- Waste of banana peel.

Solutions

- ❖ Commercial production of whole green banana flour (to curb much importation of wheat by approx.40%)
- ❖ High nutritional content (K 78.10, Ca 19.20, Na 24.30, F 12.41, Mn 76.20 mg/g).
- ❖ Production of reduced gluten content baked products eg Bread.
- ❖ Harvesting of mature Green banana and immediate processing.
- ❖ Complete utilization of banana peel.

Business Model

- A target population of about 350,000 within Tharaka Nithi County produces and consume banana (commercializing it countrywide).
- Infants (producing infant baby food)
- Reduction of bread price by 5%.
- Use of promotional services e.g. advertisement, branding etc.
- Proper packaging and labeling to attract customers.

Conclusion

This a food entrepreneurial idea that when commercialized would contribute to nutrition and food security in Kenya, provides employment opportunities, reduce wheat importation and enhance economy.

MOMBASA RAHA SUN CRUISE HOTEL

The Team

- ❖ *C.E.O-Victor Ochich*
- ❖ *General manager/Managing director-Mwaruta Kiimbio*
- ❖ *Accounts manager-NDEGWA*
- ❖ *Director sales and marketing-SIMON TSUMA*
- ❖ *Director human resources-Njiiri Isaiah*
- ❖ *Executive chef-AHMED SALIM*
- ❖ *Maintenance manager-NICK CHALTON*

PROBLEM

The Mombasa Raha Sun Cruise Hotel is a viable business that can be established in Chuka following a thorough market research and customer analysis. It seeks to address the following problem in the local area in as far as hotel industry is concerned:

- a. Lack of unique and best quality coastal foods that the currently established local hotels are not able to offer.
- b. The local hotels have not been able TO cater for the high demand for coastal foods by the students and some of the local people i.e. 'Pilau', 'Biriani', 'Mahamri', 'Kaimati' etc.
- c. There has been lack of exposure of some of the local people and students to some of the unique coastal dishes.

SOLUTIONS

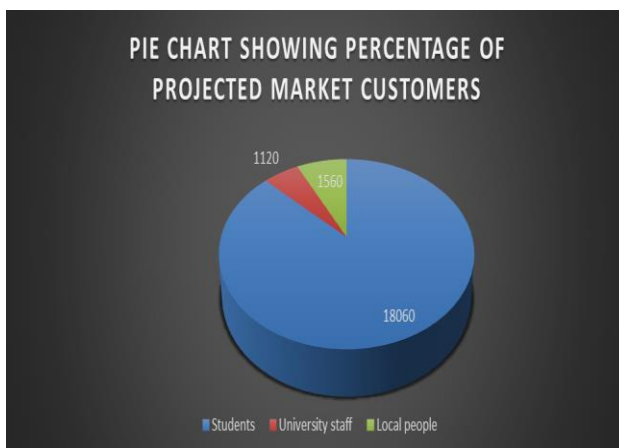
The foundation of Mombasa Raha sun cruise hotel is focused in offering the following solutions in the hotel industry locally:

- a. Provision of unique, best quality coastal foods that the currently established hotels are not offering.

- b. The hotel will be focused in bring ‘Mombasa close’ to the people food wise in the quest of meeting the high demand for some of the coastal foods by the students and local people
- c. To expose the local community and students to some of the unique coastal foods

BUSINESS MODEL

Mombasa Raha Sun Cruise Hotel will be tailored specifically to meet customers’ needs in terms of offering unique coastal meals and quick foods as per demands of the customer. The hotel will serve a wide market provided by the students, university staff members and the generally the local people as main target customers.



- Students – 87%
- University Staff – 5%
- Local Community – 8%

- The Business is quite implementable through the identification of a strategic location near the busy roads and having in place a team of an experienced and effective staff.

- ❑ The hotel in uniqueness differs from other locally established hotels in terms products and service offered hence giving it an upper hand in the competitive business of the hotel industry locally
- ❑ The hotel will be focused in offering the following unique products at reasonable price:
 - Mahamri @Sh.5
 - Kaimati @Sh.5
 - Pilau @Sh.150
 - Viazi Karai @Sh.5
 - Biriani @Sh.150
 - Madafu @sh. 50
 - Maharagwe ya nazi @Sh.30
 - POJO YA NAZI @SH.30

Marketing Plan

- ❑ The strategic location of Mombasa Raha Sun Cruise Hotel along busy roads of the area will make it stand out in the market and to the customers. An effective advertisement strategy will be established including a website for the business, social media platforms i.e. Facebook, WhatsApp and posters.
- ❑ Promotion to the customers will form part of the business as a way of convincing customers to continue being part of the hotel. The focuses in providing unique best quality meals and services that other hotels are not providing to the customers as part of customer retention to always come back again.

PENTA HEALTH

Presented by: Emmanuel Muthui, Mercy Ndanu and Britney Joyce

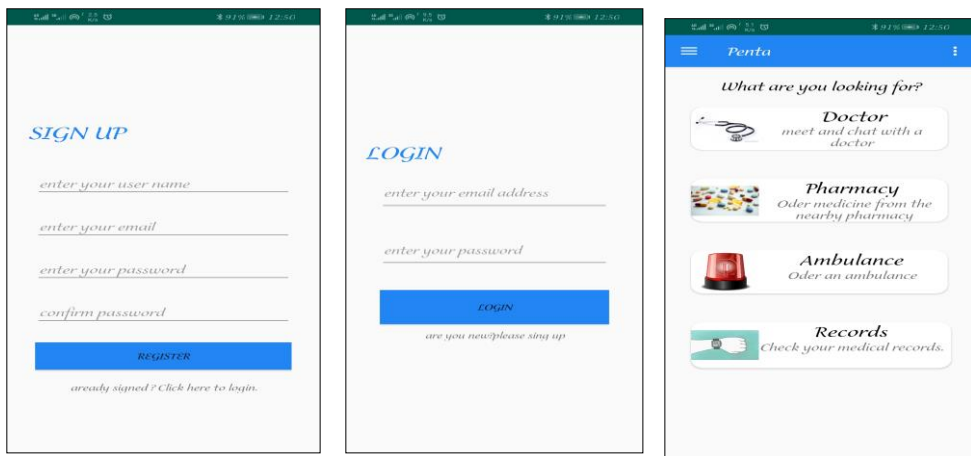
Moto: Your Health and Safety Partner

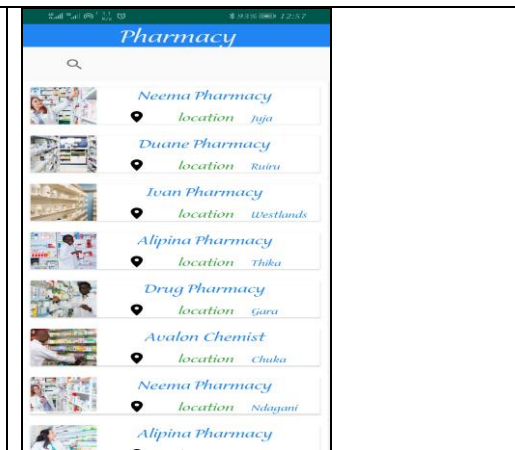
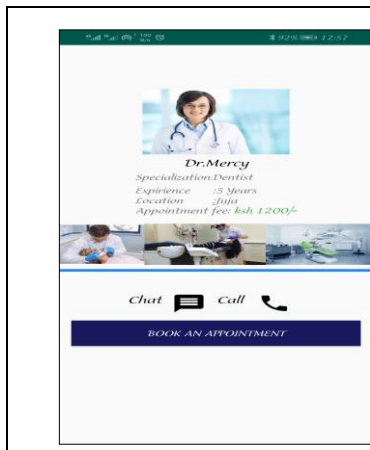
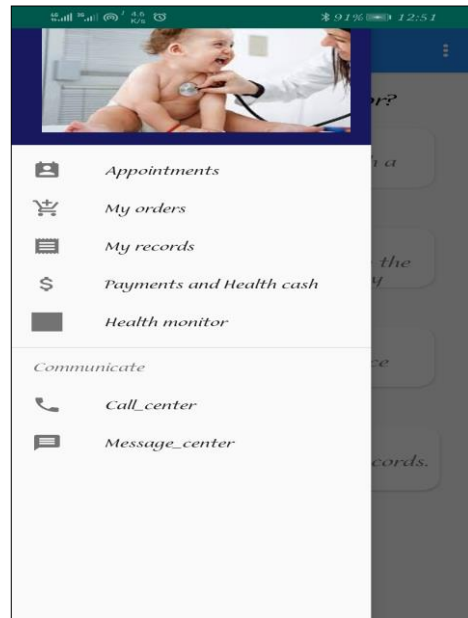
Problem

- Fraud, corruption and abuse in Africa’s health sector.
- Lack of trust and confidence
- Unavailability of quick and efficient, systematic, and reliable healthcare communication platforms
- Lack of TRUST in DATA recording, storage, usage and handling
- Doctor to Patient Ratio: 17:100,000 Vs. 100: 100,000 (WHO)
- Billions lost on fraud and abuse
 - \$58.5 – 83.9 Bn (Ks. 5.85 - 8.39 Trillion); FBI \$40 Bn (Ks. 4 Trillion)/year – Insurance Fraud (2018)
 - \$109 M (KS. 11 Bn) – (Source: Ministry of Health (2018))
 - \$5.37 M (Ks. 537M) – Losses (IRA)

Solution

Penta Health: A safe and transparent on-demand healthcare communication, diagnosis and management platform connecting patients/individuals and healthcare service providers anywhere, anytime. Powered by Block chain, AI and I.O.T to help manage healthcare transactions.





BUSINESS MODEL

► Available Market

1.216 Billion (49 Million-Kenya)

► Addressable Market

444 Million mobile subscribers

- 250 Million; Smartphone; 41Million- Kenya

► Market share

$(0.444/1.216)*100 = 0.3651315789$

Appr: 36.51%

B2B

Partnering with Insurance companies

Commission based revenue Model

- 2% commission on every transaction recorded.

B2C

Customer-driven business – Marketing

Subscription

On-demand mobile payments

Competition



Competitive Advantage

- Block Chain and AI integration.
- Secure, private and globally accessible personal medical records and transactions.
- Both online via web/mobile and offline using USSD
- Convenience for users

- Low-cost entrant (affordability)
- Compatible integration with wearables, and diagnostics.

	<p>Emmanuel Muthui Founder, C.E.O/C.F.O, Marketing A passionate problem solver, innovator, entrepreneur at heart, thinker and team player with 4 years of active organizational leadership and strategy development.</p>
	<p>Mercy Ndanu Developer and UX designer A passionate and self-driven developer with a desire to use technology to transform communities across Africa.</p>
	<p>Britney Joyce Developer/HR and PR A team player, leader and passionate developer with a dream of using her skills shape the course of Africa step by step.</p>

RAYKIM GRAPHICS AND DIGITAL MARKETING

The Team

1. Raymond Muthengi - Digital and Motion Graphics Designer
2. Chege Bryan - Web Developer
3. James Njenga - Graphics Designer
4. Dennis Muchemi - Photographer

RAYKIM GRAPHICS AND DIGITAL MARKETING **WHO ARE WE?**

Raykim Graphics and Digital Marketing is a company that solves all your digital design issues.

Our team comprises young and fresh minds that ensures creativity and innovation is applied whilst professionalism is maintained. Our slogan is creating to inspire because we hope that every content we produce ignites a flame in the hearts of its viewer while also gladdening our clients.

At Raykim Graphics, we believe in delivering quality services to our clients in a transparent, pocket-friendly way that will leave you with no choice but to visit us for more of our works.

WHY CHOOSE RAYKIM GRAPHICS?

Raykim Graphics will not only give you the best quality there is in the graphics design industry but also we ensure that uniqueness is a key factor in our products.

We overcome the boringness that comes with conformity and give unique, appealing works that will leave you begging for more.

We have a highly qualified team that has specialized in the various bits of our services, the very best in each field.

We also value customer input in our designs and consult as much as possible to create exactly that which our client deserves.

At Raykim Graphics, everyone's view is welcome.

OUR COMPETITORS.

The main competitors of Raykim Graphics are the mainstream media houses in Kenya because they create their own content. However we have turned this competition to our advantage and used their channels to push our products further.

By giving them out TV commercials to air, Raykim Graphics ensures that it expands its territory.

The internet is also full of designers whom cannot be fully trusted and this poses a challenge but our work speaks for us.

Despite this competition, we use the internet to our advantage in ensuring that we reach the global market and push ourselves to international standards.

WHAT WE OFFER

Our services range from simple designs such as calendars to more complex ones such as computer generated images.

All this we do for a variety of clients from: individuals, groups, institutions, parastatals and even companies.

Generally, we offer services in this fields of:

1. Graphics
2. Photography
3. Videography
4. Animations and motion graphics
5. Digital marketing
6. Web design and development
7. Branding

Just to mention but a few.

AFRICANISM JEWELRIES

Team

- i) Marketer – Ruth Wanjiru*
- ii) Jeweler - Brigid Mwenje*
- iii) Designer - Joseph Maingi*
- iv) Supplier - Titus Kimani*

MOTTO: Making money while preserving Africanism

PROBLEM

1. Influx of foreign jewelries which have negative impacts on human skin.
2. To revive the dying African culture.
3. Over dependency of imported products.

SOLUTION

- 1) Instill confidence in our African community by selling commodities associated with our traditions and culture. This is aimed at making them believe in themselves which is a valuable quality in running enterprises.
- 2) To create employment for youth by marketing, distribution and sales.
- 3) To make use of the natural resources available, for instance, sisal, stones
- 4) Generate income to expand to other sectors such as talent nurturing.

BUSINESS MODEL

- ❖ Products costs will be relatively cheap because raw materials are readily available. For instance, a kilogram of sisal goes @ 30, and a strand of five beads @ 25.
- ❖ Target market and population. Young people between 18-35 yrs.
- ❖ Advertisement: social media platforms. For instance, WhatsApp, Facebook, I.G. and Twitter.
- ❖ Payment model includes, cash, M-PESA, and Banking transactions.

PREPARATION OF ORGANIC FERTILIZER USING FRUIT PEELS

Presented by: Githinji David and Philemon Moseti
BSc in Agricultural Economics



Problem statement

- Organic fertilizer has been in use for decades in solid form by small scale farmers which makes it to be a slow nutrient release process.
- Due to this challenge that farmers practicing urban farming can't keep livestock for manure, I bring up the idea of using fruits peel to prepare foliar organic fertilizer and commercializing it.
- The start-up is mainly focusing on three major nutrients that are demanded by plants in large quantities, i.e. Nitrogen, Potassium and Phosphorous.

Banana peel

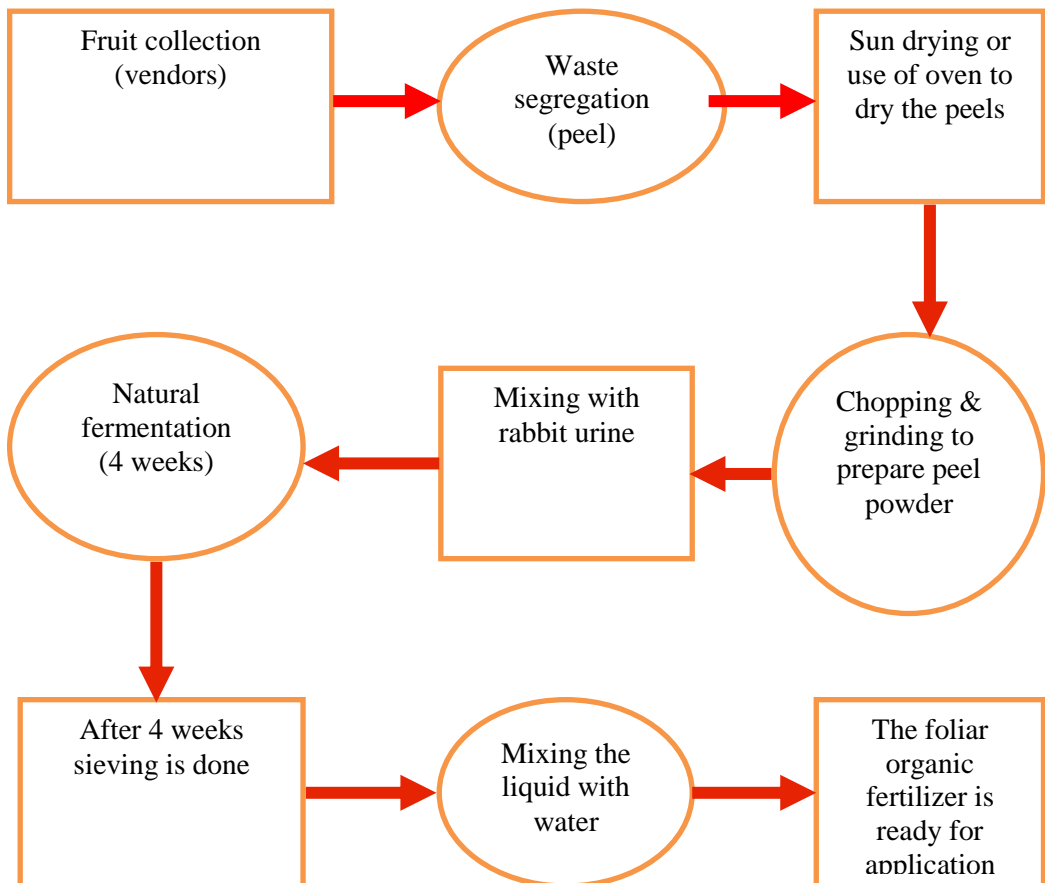
- This is the most fruit consumed in the country due to its high production and supply to our local market.
- The fruit peel doesn't contain everything the plant need but as they decompose banana peel adds potassium as well as small amounts of nitrogen, phosphorous and magnesium to the soil in a similar fashion as a slow – release fertilizer.

Orange and sweet lime peels

- Orange and sweet lime are both citrus fruits and they are to be prepared together.

- Oranges are rich in minerals like potassium, phosphorous and manganese in different amounts.
- The sweet lime is a good source of calcium, zinc, sodium and especially potassium.
- NB: All citrus fruits are very valuable sources of potassium which is needed to ensure the water and electrolyte balance

Orange and sweet lime peels



Possible benefits

Measurements

20 g of banana peel powder, 20g of citrus fruits peel powder and 1litre of rabbit urine is used to give 1litre foliar organic fertilizer. This is to be mixed with 19litres of water to give a 20-liter solution

Benefits

- Lowers the cost of farmers' income spent in purchase of farm input therefore increasing farmers' marginal income.
- The nutrients can be directly absorbed by the plants. Making it effective in the use of foliar fertilizer.
- It is easier to manufacture and the farmer can prepare on-farm level.
- For urban farming practicing small scale farming and home gardening can easily get the product in the market.
- Environmentally friendly and good production of food to be used by people with diabetes.
- Can be applied even in areas with low rainfall as it is water saving

Business model

Preparation of 1litre of the foliar organic fertilizer

- Labor input = 200
- Specimen bags = 100
- Packaging container (branded) = 150
- Cost of grinding = 150
- 1litre of rabbit urine = 100
- Fruits peel are locally collected
- Marketing and other variable cost = 100

Total cost of production = 900

Possible market price = ksh.1000 per litre.

Possible market – all small scale farmers and farmers using hydroponics.

TAMU JUICERS

CEO (B/S Admin): Abigael M. Ndanu

Marketing and sales personnel: David G. Karanja

Vision: Preparation of nutritional health beneficial natural gooseberry juice.



STATEMENT OF THE PROBLEM

- ▶ The common cases of cancer in the world are 2.09 million and Kenya has not been left out. In Kenya one of the leading causes of death according to KNBS is cancer with 8% where 30,000 people in Kenya die every day.
- ▶ Currently, Kenya's biggest public health concern is hypertension (high blood pressure) the most common cardiovascular disease accounting to 50% of hospital in-patient admissions and 40% of hospital deaths according to WHO. 3/10 of persons in the world are living with high blood pressure.

- ▶ Ischemic heart disease and stroke have accounted for 15.2 million deaths globally. In 2016 and has for the past 15 years been the major cause death globally.
- ▶ 4 million Kenyans have asthma according KNH which is the commonest chronic lung disease in the world but in many parts of Kenya it remains under diagnosed.
- ▶ The Kenyan government allocated 60.3 billion Ksh in 2016/17 on healthcare which has been projected to increase each year.

Solution

Benefits of natural gooseberry juice

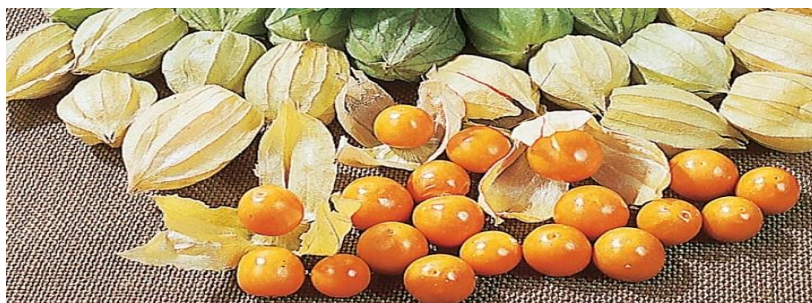
1. Chemotherapeutic agent against lung cancer, gooseberries contain withanolides which have medicinal value which include anti- inflammations, anti-cancer, adoptogenic and anti-oxidant effects and contain hydroxywithanolides used for cancer therapies in killing oral cancer cell especially in lung cancer.

2. Anti-Inflammatory properties which help treatment of asthma, Cape gooseberries are rich in anthocyanin's which prevents inflammation caused by pain, swelling, and redness. Also, due to the presence of polyphenols and other antioxidants, these berries may help in treating disorders like asthma which is basically the inflammation of tracheal passage.

3. Controls high blood pressure, due to the presence of phyto-chemicals such as polyphenols and carotenoids, cape gooseberries can regulate high blood pressure levels. These chemicals along with the soluble pectin fibre keep bad cholesterol levels in check and promote heart health.

4. Protects against cardiovascular disease and strokes.

5. Management of cold and flu because it contains anti-oxidants



Model

- Use of contract farming for consistent and continuous supply of gooseberry fruits.
- The prepared juice is packaged in tetra packs and bottles and distributed to various outlets across the country.

Day production estimate

Returns a day

1kg of gooseberries – Ksh 600

cost per ltr- 316 Ksh

1kg – 2 ltrs of juice

sales per ltr – 450 Ksh sale per 300ml

of the juice – 150

250 kg of berries to produce 500 ltrs daily profit per ltr ksh 134

Costs and expenses a day

Cost of berries in a day- $250 \times 600 = 150,000$ profits in a day (134×500)

Cost of packaging in 300ml tetra packs and bottles =67, 000

No of bottles required – $1,700 \times 4 = 6,800$

Labour cost a day – 1000

Electricity -500

Equipment – 200

Total costs Ksh 158,000

Impact of the Idea

- Creation of employment for people involved in supply and value chain
- Generation of income to farmers
- Better living standards
- Food security and better nutrition
- Reduced cases of cancer, strokes, asthma and blood pressure. Good health and well-being.
- Reduction of costs the government and its citizen have to spend to acquired medicines.



NETWORK MARKETING: DIAMOND MARKETERS

Team members

- 1: Franklin Mokuu: computer scientist*
- 2: James Mwaniki: community health and development*
- 3: Andrew Ouko*

VISION

To help small business owners boost sales through networking and reduce unemployment rate

Current problems facing small businesses

- 1: Poor visibility and lead generation.
- 2: Choosing the right social media platforms
- 3: Producing and delivering content.
- 4: Poor budget.
- 5: Lack of awareness in the market.

Solution

- 1: Poor visibility and generation of quality leads:
 - Partnering with companies to help them obtain quality, readily hosted websites and email marketing software at a discounted price hence increasing their credibility and generate highly qualified leads and hence customers.
 - By introducing the idea of click funnels resulting in more sales.
- 2: Choosing the right social media platforms.

- Study what their products can solve to the needs of their customers and intensively research on which platform specifically the customers are found.

3: Producing and delivering content.

- Writing highly converting sales copy that will enable them to increase sales.

4: Poor budget.

- Spending problem is the greatest challenge to many businesses as they are unable to differentiate between revenue and profits.
- By formulating for them the right budget for the business they'll be able to reduce on costs of advertising and avoid encroaching into the finances used to run the business.

5: Lack of awareness in the market.

- Doing research on current market trends and identifying the competition hence I help them figure out how to create irresistible offer to their customers helping them be ahead of their competitors.

The business model

- Target market:

Small business owners and youth.

- Source of revenue

Network marketing business currently ongoing.

POSTA KENYA INTERGRATION: REBRANDING POSTAL KENYA SERVICES

Team

<i>Kellie Mugambi</i>	<i>Marketer</i>
<i>Emmanuel Kireri</i>	<i>Service Manager</i>
<i>Antony Mbaya</i>	<i>Managing Director</i>
<i>Ishmael Kibet</i>	<i>Legal Advisor</i>
<i>Victor Mwendwa</i>	<i>Developer</i>
<i>Stephen Njoroge</i>	<i>Developer</i>
<i>Newton Muchiri</i>	<i>Marketer</i>
<i>Joyce Wairimu</i>	<i>Marketer</i>

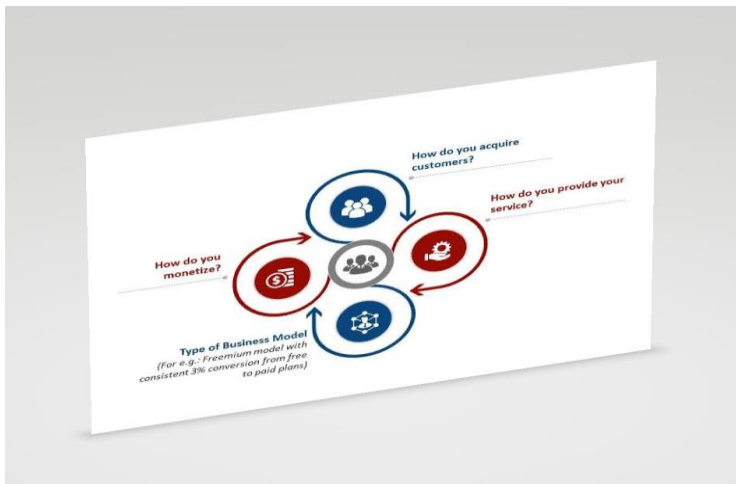
Problems

1. Under-utilization of Postal infrastructure: buildings, vehicles and space.
2. Lack of an online POSTA market services.
3. Low speed in delivery is a key problem facing Posta Kenya.
4. Misinterpretation of the post boxes whereby parcels belonging to one box may end up in another box.

Solutions

PROBLEM	SOLUTION	IMPACT
1. Under-utilization of Postal infrastructure Postal buildings, vehicles and work space.	Set up Hosting center, Postal market warehouse, vehicles for shipments, Rental/Revenue collection agencies.	Goods close to consumer Maximum resource utilization
2. Lack of an online POSTA market services	Have a postal market system	Accessibility
3. Low speed in delivery plus security is a key problem facing Posta Kenya.	tracking of delivery	Real time updates
4. Mis-interpretation of the post boxes whereby parcels belonging to one box may end up in another box.	Introduce online mailing services to the customer. Posta can give customers online mail accounts hence minimizing the risk of mixing clients vital documents.	Happy customer

Business Model



► How do you acquire customers?

Customer acquisition will first of all incorporate existing customers of the organization being advised to open Posta Market Account. The staff of the parastatal will assist customers facing difficulties to open new accounts. Marketers will go on ground for customer sensitization.

New customers will be acquired through advertising the Posta Market platform via electronic media such as Television and Radio adverts.

► How do you provide services?

Creation of Posta Market platform

Creation of Web Hosting Services

Setting up rental/revenue collection agency

Providing shipping services for booked products

► How do you monetize.

We will charge fee on services provided.

Monthly/Annual hosting charges.

Commissions from agencies.

Profits made from selling goods online.

VEGGIE HERO

Presented by:

Katua Katuli, Kipng'eno Dominic and Florence Nduku Katumo

Mission

- Reducing postharvest loss of vegetables.
- Increase of vegetables shelf life up to 8 months for food security and affordable healthcare
- Zero hunger
- Zero environmental pollution.
- Good health and well being
- Responsible consumption and production.
- Vegetables for better nutrition.

Problem

Food insecurity through post-harvest losses of vegetables

Statistics on food losses in East Africa

2000-100%

2001-2005-95%

2006-2012-94%

Current post harvest in losses Kenya 50-65%

Solution

- Increasing shelf-life of vegetable
- Value addition by use of vegetables stalks
- Tomato powder

Crude protein analysis

Sample type	Leaves	stalks
Amaranthus	27.72	16.89
Spinach	25.88	17.66
Kales	28.67	12.71
Cabbage		8.44

Business Model

- Who are our customers?

Target customers/market size

- What value is created/added?

Nutrition improvement

Health

Time saving

Increased market share,

- Price

Cost of producing one unit, 4 kg @ Ksh20, cost of solar drying Ksh30
selling price per unit of dried kales is Kshs 200.

Package the product at different quantities

COZY APP

Team: Perminus Kaburu: Partner and Cyrus Njuguna: Partner

Problem

Locating a space either to conduct business or simply to live in that fits your expectations and also meets the proper standards.

Solution

- Give real time information on vacancies, their locations, their state [upload pictures on the state of the spaces and their amenities], allow online bookings and payments provide owner contacts/caretakers.
- Allow custom searches.
- This is to bridge the gap between a tenant/buyer to a suitable space

Business Model

Marketing

- Allow free app download from Playstore
- Dominate city/major town after major town using fliers
- Post adverts on major websites blogs and vlogs
- Through social media advertising in platforms such as Facebook
- *Our target market is anybody wishing to sell/buy/rent space.*

How Do We Earn

We charge a monthly fee for one to have a slot in our app [according to their rent/cost to achieve 20% of development costs required to maintain the app]

- We charge 30% of the rent or an agreed upon percentage of the rent/cost on each customers that comes through our app.

AJOTRACK

Team

1. *Ajona Warioba Kumba = Founder and Business Adviser*
2. *Wilson Mwiti Muthee = Software Developer*
3. *Jennifer Kibiri = Programmer and Marketer*
4. *Fidelis Waweru = Hardware Developer*

Introduction

This is a mobile application that tracks people, company, farmers etc assets. It makes use of GPS devices attached to an asset that is connected to a smartphone.

Problem

Most small businesses have problems in tracking their assets and relaying real time updates

- People losing their assets
- Farmers finding hard to track their crops and livestock
- Parent finding it hard to locate their children while at school
- Finding it hard to locate assets in your house
- Losing of luggage while traveling
- Losing of house keys

Solution

- Tracing lost items for example keys luggage, personal items etc
- Mapping locations in a company to trace the current location of its employees and assets.
- Farmer will have an easy way of tracking where each crop is in a large farm.

- Farmer will trace their livestock by attaching the device to each of them.
- Parents by attaching the device to a child in school will track the child while at work.
- Tracking every asset at home i.e house staffs while travelling each luggage will be tagged to
- Prevent theft and misplacement.

Business Model

Ajotrack will provide a GPS tracker connected to a smartphone that tracks animals, people and assets by companies, people and farmers

Company description

Key employees will be programmers, software developers, business advisors, hardware developers and marketers.

Target market

The target market will be any one in the world that owns anything that he/she fears to lose. Companies that want to keep track of the whereabouts of its assets and employees. This is a whole world solution and everyone needs this device, just like phones.

Products and service line

The company will provide each chip at a cost of \$30. Providing technical assistance if theirs is a break down.

Product model

Determining the final price of the product

Production cost = hardware +software+manpower = \$12

Final price in producing country = \$30

Transportation cost = \$2

Taxation = \$4

Insurance = \$2

Profit = \$10

Current industry

- Wildlife tracking
- Motor vehicle companies
- Military

JEMCO CLEANING AGENTS

Business Manager: James Mwaniki

Business Admin: Millicent Moraa

Business Marketers: Purity Wangari and Kelvin Mutua

Business Officer: Stephen Kioge

Products

Bleaching agent

Disinfectant

Soap detergent

Problem

- Unaffordability of the existing detergent
- About 60% of Kenyans cannot afford to purchase cleaning agents.

Solution

Making affordable detergent at subsidized prices

Business model

Production cost	Selling price	Existing market price
Bleaching agent Ksh. 100/- per 5 liters	Ksh. 350/- per 5 liters	Ksh. 970/-
Disinfectant Ksh. 250/- per 5 liters	Ksh. 1000/- per 5 liters	Ksh. 7500/-
Soap detergent Ksh. 250/- for 10 liters	Ksh. 500/- per 5 litres	Ksh. 750/-

DEEs INTERIOR DÉCOR

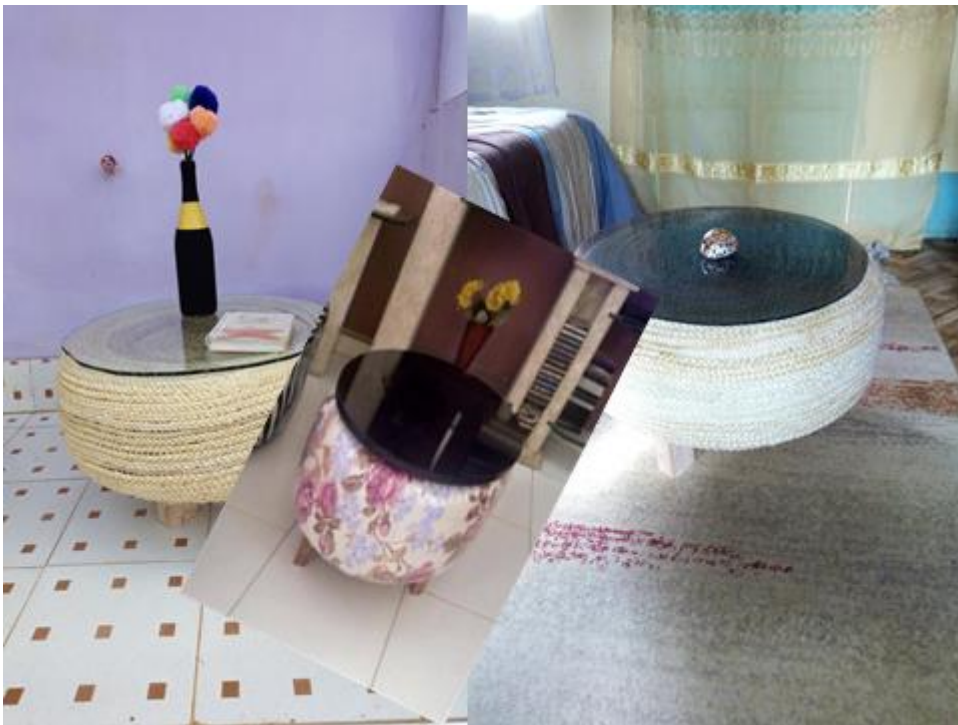
Presenting Team

Dorine Odhiambo – Founder, designer and marketer.

Kahendi Doreen - Founder, designer, marketer.

Naini Sharon – Assisting team.

Kanana Doreen – Assisting team.



Problem

It is estimated that in Kenya, about 34,000 tonnes of waste tires have been burnt haphazardly, dumped, destroyed or re-used by methods that pollute the soil, air and ground water since 2010.

The main problem to be addressed in this project is therefore environmental degradation.

- Environmental pollution air, soil and groundwater.
- Youth unemployment.

Solution

Conserving the environment is vital and it comes with great benefits to the biodiversity. Our main aim is to reduce the damage caused to the environment following burning and dumping of rubber tires. This is by recycling them into valuable assets such as coffee tables, stools, chairs, ottomans/puffs and storage items. By doing so, we will be also creating a source of income for the youth and the community within.

Business Model

- Cost analysis

Production cost	Selling price	Existing market
KSH.2,300	KSH.4,000	KSH.6,000

The prices range from 3,000 to 15,000 depending with the household asset, the design, size and materials used.

Business plan

Specific audience – households, institutions like schools, hotels and spas for the offices and lobbies.

CRAFTY SOULL

Presenter: Faculty of Humanities and social Sciences

Recycling glass bottles beadwork



Problems

1. Soil and land pollution caused by glass bottles
2. Lack of long lasting African jewelry/craft

Solution

1. Reusing glass bottles to make home décor items and glasses
2. Beading to solve the issue of lack of long lasting beaded African jewelry

Impact

Reduced soil and water pollution

Less glass objects lying in landfills or bins that might be a health hazard.

Business model (Beadwork)

Cost analysis

ITEM	QUANTITY	PRICE
beads	4	200
thread	2	120
needles	4	40
combs	20	40
nails	5	25

Target market

1. Boutiques: 30% of our items are sold at a wholesale price to individual boutiques
2. Social media users: 25% of our customers are social media users. We reach them through Facebook ads
3. Individuals: constitute 45% of our customers
4. Beading community
5. Out of the money made 30% goes into paying the team, 30% goes into transportation, buying new supplies and sponsoring the ads.

Business model (Recycling glass bottles)

ITEM	QUANTITY	PRICE
Spray paint	4	1320
Glass bottle cutter	1	2500
Sand paper	1 metre	150

Target market

1. Art shops: 22% of our items are sold at a wholesale price to art shops.
2. Social media users: 32% of our customers are social media users. We reach them through Facebook (@craftysoull)
3. Hotels: We sell our items to local hotels and they make up 20% of our customer base
4. Individuals: 36% of our clients are individuals.

Out of the money made 30% goes into paying the team, 30% goes into transportation, buying new supplies and sponsoring the ads.



LIST OF FACULTY EXHIBITIONS

S/N Title of presentation

School of Nursing and Public Health

- 1 Mental health and art
- 2 Cold box
- 3 Plant milks
- 4 Gambling addiction and recovery
- 5 Breast self-examination
- 6 Multi-viewing teaching microscope
- 7 Assessment of individual health

Faculty of Agriculture and Environmental Studies

- 1 Small-scale production charcoal briquettes using cow dung
 - 2 Mango roll up
 - 3 Cakes
 - 4 Table setting and napkin folding
 - 5 Cocktail and mocktail production
 - 6 Detergents
 - 7 Avocado jam
 - 8 Utilization of banana pseudo stem in flower arrangement media
 - 9 Utilization of banana pseudo stems as a rooting media
 - 10 Utilization of banana inflorescence as vegetable to enhance food and nutrition security
 - 11 Fruit arts
 - 12 Puffed pastry
 - 13 Display of peculiar organisms
 - 14 development of tamarind food toffee using honey as sweetener
 - 15 Sambaza karanga
 - 16 Drone technology
 - 17 Integrated farming
 - 18 Preparation of hand sanitizer and milking salve using locally available materials
-

- 19 Utilization of locusts as animal feeds
- 20 Making total mixed ratio for dairy animals

Faculty of Business Studies

- 1 Crochet
- 2 Paper pellet
- 3 Banana-lemon flavoured spiral smokies
- 4 Afrique yummy hot dogs
- 5 String art
- 6 Chia nut butter
- 7 Marketing discussions - 4Ps and branding
- 8 Music and CDs

Faculty of Science, Engineering and Technology

- 1 Medicinal plants
- 2 Marine and terrestrial organisms
- 3 Digital microscope
- 4 Drone technology
- 5 Geraden automotive accident curb
- 6 Chicken-egg lysozyme as a potent antibiotic
- 7 Extraction of pharmaceutical in water
- 8 A natural language processor for vernacular translation
- 9 Wasomi net
- 10 Math specializations
- 11 Computational material science
- 12 Resistivity survey
- 13 Mind-Boggling Mathematics

Faculty of Humanities and Social Sciences

- 1 Interior décor
- 2 Recycling of waste bottles
- 3 Earing holder
- 4 Videography software broadcast and livestream

- 5 Green growth
- 6 Attitude related to traditional and modern society
- 7 Geospatial data to map and compare carbon stocks and forest degradation levels
- 8 Mathenge
- 9 Chuka University location map
- 10 Drivers of agricultural intensification
- 11 Remote sensing for water quality in Ndakaini dam
- 12 Yield gaps
- 13 World maps
- 14 Jemco cleaning agents
- 15 Monitoring *Prosopis julifrea*

Faculty of Education and Resources Development

- 1 Staff and students projects
- 2 ODEI
- 3 structure of the earth model
- 4 CBC Framework
- 5 Geo board
- 6 CBC Abacus model

Faculty of Law

- 1 Samples of books of Law
-

LIST OF EXTERNAL EXHIBITORS

1. KPLC - Chuka
2. Post Bank Chuka Branch
3. Stima Sacco
4. AA Kenya
5. Legacy Star Hotel
6. Climate Pal Ltd
7. KLB
8. Britam
9. Mount Kenya Integrated Community Development Organization
10. KENIA
11. Trans Nation Sacco
12. KIPI
13. KSG Embu Campus
14. KUCCPS
15. Rirac Driving School
16. Nature Kenya
17. Kenya Police
18. Sweet & Dried
19. Akili Dada
20. Jomo Kenyatta Foundation
21. KWS
22. HELB
23. KEMI
24. Alumni Association

LIST OF MENTORED SECONDARY SCHOOLS

1. Ikuu Boys High School
2. Rubate High School
3. Kiereni High School
4. St. Augustine Mwea Boys High School
5. Baricho Boys High School
6. Moi Equator Girls High School
7. Mikumbune Boys Secondary School
8. Kaaga Girls High School
9. Muthambi Girls High School
10. Igwanjau Secondary School
11. Karamugi Girls Secondary School
12. Mukuuni Boys High School
13. Kiamutugu Boys High School
14. Gikurune Boys High School
15. St. Agnes Kiaganari Secondary School
16. Kiandegwa Secondary School
17. Gatuto Secondary School
18. Muthambi Boys High School
19. Upper Mikumbune Secondary School
20. Kambandi Secondary School



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