MASENO UNIVERSITY CONFERENCE ON RESEARCH CAPACITY BUILDING

THEME: "PROMOTING RESEARCH EXCELLENCE FOR SUSTAINABLE SOCIO-ECONOMIC DEVELOPMENT"

6TH TO 7TH JUNE 2019

VENUE : KISUMU HOTEL, MASENO UNIVERSITY

NARRATIVE REPORT OF THE PROCEEDINGS

Dr. John King'oina – Rapporteur

Dr. Odhiambo James Oduke – Rapporteur

LIST OF ABREVIATIONS / ACRONYMS

AFD - Administration Finance and Development

AFIDEP – African Institute for Development Policy

APHRC- African Population and Health Research Centre

ASA- Academic and Student Affairs

CDC- Centre for Disease Control and Prevention

DAAD- Deutscher Akademischer Austausch Dienst (German Academic Exchange Service)

DVC – Deputy Vice Chancellor

EAC – East African Community

EgU – Egerton University

GoK – Government of Kenya

ICIPE – International Centre for Insect Physiology and Ecology

IRB – Institutional Review Boards

K.I.P.I – Kenya Industrial Property Institute

KEMRI – Kenya Medical Research Institute

KENIA – Kenya National Innovation Agency

KMFRI – Kenya Marine and Fisheries Research Institute

LVBC – Lake Victoria Basin Commission

MOE – Ministry of Education

MU – Maseno University

MUREC – Maseno University Review and Ethics Committee

NACOSTI – The National Commission for Science Technology and Innovation

LIST OF ABREVIATIONS / ACRONYMS

NBC - National Bioethics Committee

NIS – National Innovation System

NRF - National Research Fund

PRI – Partnerships Research and Innovations

RI – Research Impact

RST&I – Research , Science Technology and Innovation

SGS - School of Graduate Studis

SPHCD – School of Public Health and Community Development

ST&1 – Science Technology and Innovation

VC- Vice Chancellor

WWF –World Wildlife Fund

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ACKNOWLEDGEMENT /APPRECIATION

We would wish to profusely thank the following institutions for having participated in the two day workshop

INTRODUCTION/ BACKGROUND

Maseno University's Division of Partnership, Research and Innovation (PRI) organized a research capacity building conference which to place on 6th to 7th June, 2019 at Kisumu Hotel. The theme of the conference was "**Promoting Research Excellence for Sustainable Socio-Economic Development".** The conference focused on the following sub-themes:

1. Promoting research culture; Research funding
2. Human resource development and public engagement
3. Research management
4. Legislation impact from Lake Victoria basin

Seasoned researchers from the universities and research institutes presented their papers on a variety of topics which hinged on research and its impact on society currently and into the future.

The topics covered in a nutshell included:

The rigor and precision of research

Ethics in research especially where humans are involved

Integrity in research especially with the allocated funds

Transparency and accountability as espoused in chapter six of our national constitution.

Funding opportunities and how to source for these funds.

Writing research papers and how to get them published in reputable and recognized journals which have a conspicuous impact factor.

Case studies which were in tandem and fell in line with the theme of the workshop.

Research is nowadays not done in isolation. Multiple collaborations across the board (Multi-disciplinary and multi-institutional) is now what is recommended. Much as academic merit is also acknowledged because Masters and PHD degrees are obtained in the process, the hallmark of research is to add value to humanity and its livelihood.

This particular workshop also demonstrated that research which advices policy should be done collaboratively if it is to be portrayed as being credible and useful to our Kenyan society and even beyond.

Human challenges are myriad and complex. University research and other well established research institutions should pool their resources, expertise , experience and synergies to help provide solutions or advise the key stakeholders to convert their research findings into viable policies which will solve the gamut of human needs and aspirations especially at the socio-economic level.

What was unique in this particular conference, the presenters were extremely selfless with their knowledge, expertise and experiences which they had gathered over the years. They presented this information in quite a creative manner using Power Point.

This report presents all the presentations 'verbatim' because executive summaries of the presentations will edit some micro data or facts which are extremely important and vital in the advancement of research.

Research like creativity exists in a continuum and it is in a conference that the existing status is presented, documented and helps to chart a way forward for another workshop-cum-seminar where further research findings and experiences will be shared. The scientific research snowballs in tandem with the human concerns and challenges…

PRELIMINARIES

Session chair –cum- master of ceremonies - Dr. Owen McOnyango

The workshop was called to order at 8.30 am by the session chair **Dr. Owen McOnyango**

There was a brief introduction of the participants who had already reported .

Dr. Benson Nyambega , The director Research and Innovations made the following remarks

He welcomed all the participants to the workshop and he urged the them to engage in the workshop constructively.

He observed that this workshop is for research capacity building with the theme:
'Promoting Research Excellence for sustainable socio-economic development'

The aim of the workshop is the implementation of the dialogue between the Division of Partnerships Research and Innovations and the university management on the need to work towards making Maseno to be a formidable research University.

One strategy he noted ,is to gradually and steadily build capacity for research excellence.
He further observed that the workshop will also discuss the following :

- Promoting research culture
- Resource mobilization for research
- Research infrastructure and management
- Human resource and public engagement
- Research legislation, guidelines and procedures! and to put all this in perspective,
- Share progress in research from around L. Victoria.

Remarks from **Prof. Stephen Ogendo** , Conference chair co-ordinator.

He observed the following:

- This conference should be visualized in a unique context for instance it should be a networking conference for all the participants. They should forge links and develop research strategies, proposals, experiences to build a good research pool from the various participating institutions.
- The young researchers should be the key participants in this workshop because posterity belongs to them and they should learn good research tenets from the seniors who are also in attendance in this particular workshop.
- Ideally, the workshop should have been paperless. There is some paper on the bare minimum (The folders). The projected review of the workshop scheduled for July 2020 will be 100% paperless.
- He urged all the participants that we should move forward and make strides for a better research community within the region.

Prof. Joseph Chacha DVC PRI

He informed the participants that being a chemist he is able to manufacture his own speech and present it.

He acknowledged the following personalities who were scheduled to present their papers at the conference:

Dr. Nancy Awuor Otieno(CDC/ KEMRI)
Prof. George Mark Onyango (Maseno University)
Dr. Charles Otieno Ochieng(Maseno University)
Mr. Paul Chege(Kenya Industrial Property Institute)
Dr. Paul Mireji(YSPH/KEMRI-Wellcome Trust/BioRI- KALRO)
Prof. Philip Okinda (Maseno University)
Dr. Patrick Onyango (Maseno University)
Prof. Mathews Dida (Maseno University)
Dr. John Ayisi (Directorate of Research Science and Technology , MOE)
Archbishop Titus Zakayo Ingana (Directorate of Research Science and Technology, MOE)
Dr. Roselida Owuor (National Reasearch Fund)
Dr. Mary Aswan(Maseno University)
Prof. John Agure Ogonji (Maseno University)
Mr. Joseph Njogu (Research Beeline Limited)
Dr. Chrispine Nyamweya Kenya Marine Fisheries Institute)
Prof. Joshua O. Ogendo (Egerton University)
Prof. Collins Ouma(Maseno University)
Dr. Pamela Oloo (Maseno University)
Dr. Ally Matano (Lake Victoria Basin Commission)
Prof. Noah Wasilwa (World Wildlife Fund)

He presented the apologies of the Vice Chancellor who would have come to conduct the official opening but he had had other vital official duties to which needed his actual presence.

He informed the participants that Maseno University is an old university with a current student population of about 20,000 students enrolled in about 13 schools which house various institutes and directorates.

He noted that the core business of the university is to teach and do research and quality proposals are a prerequisite for good research which can be funded.

The challenges of replicating of propagating the research findings are what still a challenge for the university is. He gave an example of Prof. Mathew's Dida Maseno H14 maize seed which cannot be affected by the striga weed. This research was a good breakthrough. It is the mass propagation of this seed to the farmers which is still a challenge because of lack of the funding.

Innovations should be done to bring down the cost of fish in the market especially around the lake region where Maseno university is located.

Fruit waste can be used as an alternative fuel (green energy) . This fuel from fruit waste can be used to light the rural homes and power some affordable means of transport. The challenge is that this research is still at its primitive stages. This workshop should pool ideas on how we can invest and replicate such helpful research to benefit the Kenyan populace.

As a matter of importance, he singled out the Big Four Government Initiatives (Agenda) and Regional Economic Blocks created by the 14 County Governments around the greater lake region. He advised that the Universities should participate in these Government projects particularly in conducting research in order to enhance development in the counties and the Country in general.

In a nut shell, he encouraged researchers to undertake resource mobilization to ameliorate research agenda instead of depending solely on the Government capitation. In addition, he appealed to the scholars to come up with innovations which will mitigate the effects of high cost living.

As corollary f the above observations he note that the next workshop should have the component of linkages and collaboration as the audit of this workshop will be done in July 2020.

He officially declared the workshop officially opened at **9.07 a.m**.

PAPER PRESENTATIONS DAY 1 06-06- 2019

	PAPER TITLE	PRESENTER	SESSION CHAIR
1.	Institutional research culture	Dr. Nancy Awuor Otieno	Prof. John Ogonji
2.	The role of team work in promoting research	Prof. Geroge Mark	Prof John Ogonji
3.	Best Practice in research	Dr. Charles Otieno Ochieng	Prof. John Ogonji
4.	Attitudes that promote quality research (the role of the researcher)	Prof. Mathews Dida	Prof. John Ogonji
5.	Promoting research excellence for sustainable development: Role of Intellectual Property Rights/System	Mr. Paul Chege (K.I.P.I)	Prof. John Ogonji
6.	Research Grant Proposal Writing	Dr. Paul Mireji	Prof. John Ogonji
7.	Research Grant Management	Dr.Benson Nyambega	Prof. John Ogonji
8.	Research Ethics and Integrity	Prof. Philip Okinda	Dr.Pauline Andang'o
9.	Engaging Post-graduate students in research for impact	Dr. Patrick Onyango	Dr.Pauline Andang'o
10.	Scholarly writing and publications in peer reviewed journals	Dr. Benson Ojwang	Dr. Pauline Andang'o
11.	Innovations and commercialization of research outputs by universities for development	Dr. John Aysis	Dr. Pauline Andang'o
12.	Institutional and natural research management structures and policies	Archbishop Titus Zakayo Ingana	Prof. G. Netondo
13.	Multi-disciplinary and multi-institutional research	Dr. Roselida Owuor	Prof. G. Netondo
14.	The role of research in socio-economic development	Dr. Mary Aswan Ochieng	Prof. G. Netondo

PAPER PRESENTATIONS DAY 2 07-06- 2019

	PAPER TITLE	PRESENTER	SESSION CHAIR
15.	Guiding principles in postgraduate training and supervision	Prof.John Agure	Dr. David Ongarora
16.	Research Funding Challenges and opportunities in Africa	Mr. Joseph Njogu	Dr. David Ongarora
17.	Trends in Fisheries Resource Exploitation in Lake Victoria	Dr.Chrispine Nyamweya	Dr. David Ongarora
18.	How to write a paper and get it published (An insider's view)	Dr. Paul Mireji	Dr. David Ongarora
19.	Research and innovation infrastructure	Prof.George Mark	Ms. Violet Ndeda
20.	Agriculture Production in Lake Victoria Basin; Growth, Challenges and Future prospects	Prof. Joshua O. Ogendo	Ms. Violet Ndeda
21.	Emerging Human Health Challenges in Lake Victoria Basin	Prof. Collins Ouma	Ms. Violet Ndeda
22.	Research to policy in Africa: A heightened need for a changing narrative	Prof.Collins Ouma	Ms. Violet Ndeda

INSTITUTIONAL RESEARCH CULTURE

By Dr. Awuor Nancy Otieno

Kenya Medical Research Institute, Center for Global Health Research

Presentation Outline

Background information

Who do we work with?

How do we do it?

What can we improve on?

How do we sustain it?

What's the usefulness/relevance of research in our setting?

Background

Research and development (R&D) play critical role of accelerating economic development in industrialising countries

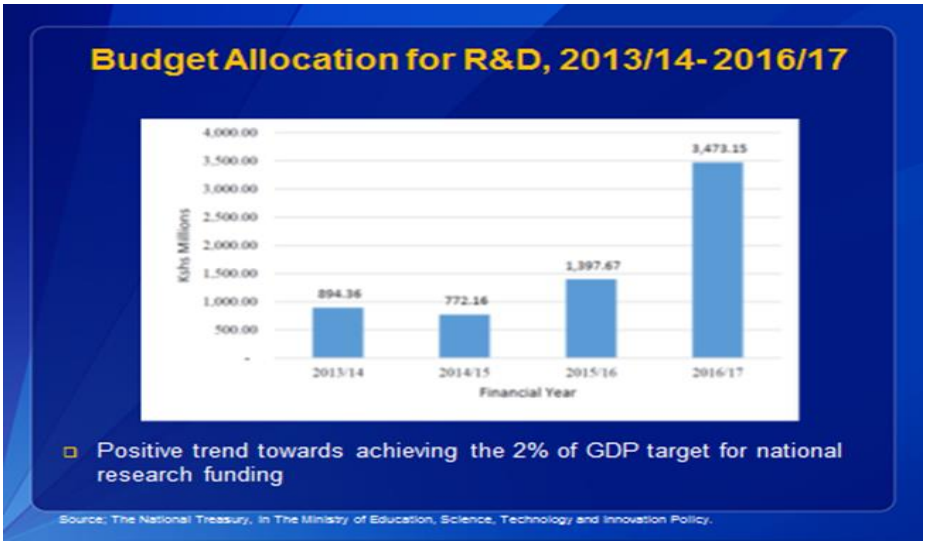
In the 3 pillars of vision 2030

Government of Kenya made effort to transform the country from factor – innovation driven economy

Coordination agencies; NACOSTI, KENIA, NRF

Allocation of funds for research (2% of GDP)

Commitment to improve technical competencies and institutional capacities for research work



Researchers FTE by field of science

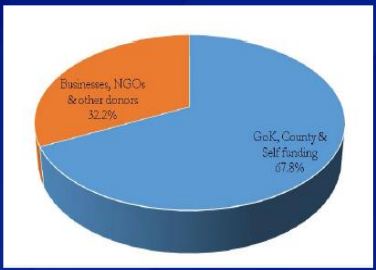
	Total	Business	Government	Higher Education	Private Non-profit
FTE by Field	**9 305**	**1062**	**1 883**	**5 647**	**713**
Natural sciences	419	56	64	261	38
Engineering and technology	1 343	190	258	861	34
Medical sciences	2 324	414	585	1 073	252
Agricultural sciences	4 302	337	840	2 889	236
Social sciences	569	39	97	342	91
Humanities	348	26	39	221	62

- Academia drives research in Kenya

Source; Adapted from Africa Innovation Outlook II (2014) in The Ministry of Education, Science, Technology and Innovation Policy.

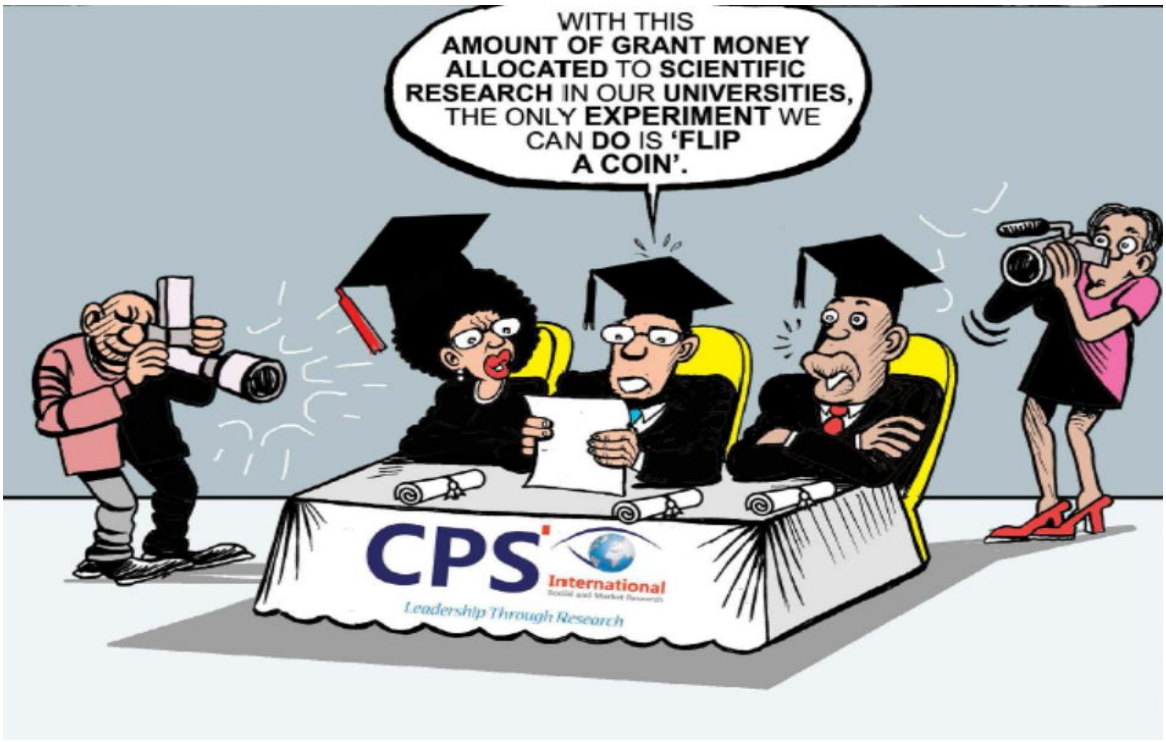
Who do we work with?

Distribution of Funds by Sector and Universities in Kenyan

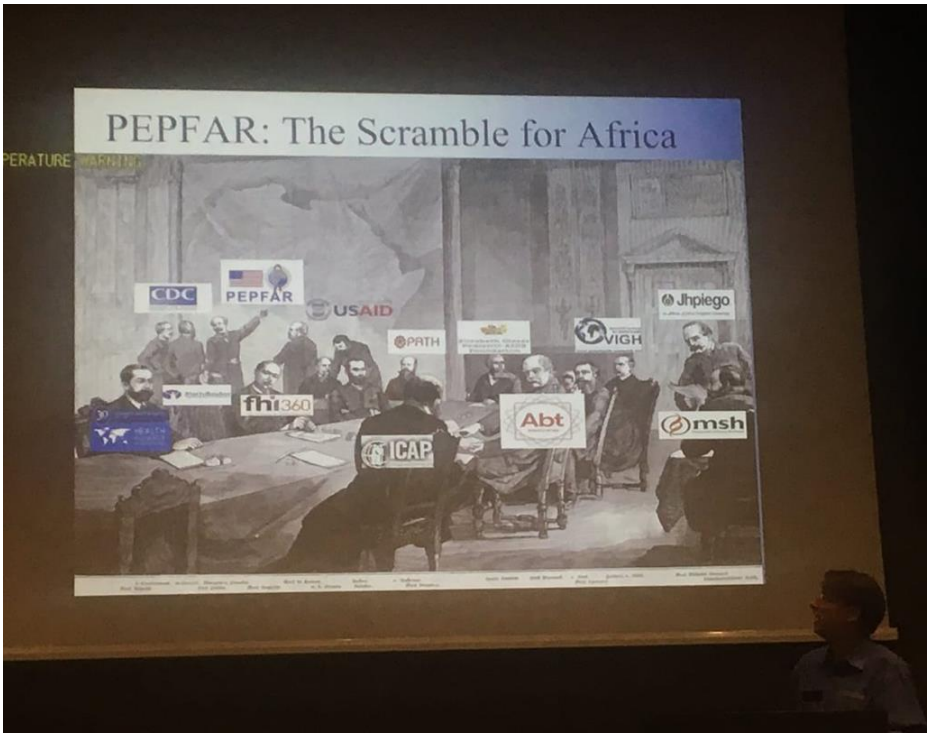


Name of the University	Value (Mn of Ksh)	Volume (% Total)
1. Kenyatta University	95.1	8.2%
2. University of Nairobi	88.1	7.6%
3. Strathmore University	78.8	6.8%
4. Mount Kenya University	71	6.1%
5. Aga Khan University	65	5.6%
6. Moi University	64.2	5.6%
7. Jomo Kenyatta University of Agriculture and Technology	53.7	4.6%
8. KCA University	47	4.1%
9. Egerton University	43.6	3.8%
10. United States International University	42	3.6%
Totals	**648.8**	**56.1%**

Source; CPS international 2018, The State of Research Funding in Kenyan Universities.



Opportunity for International Collaborations



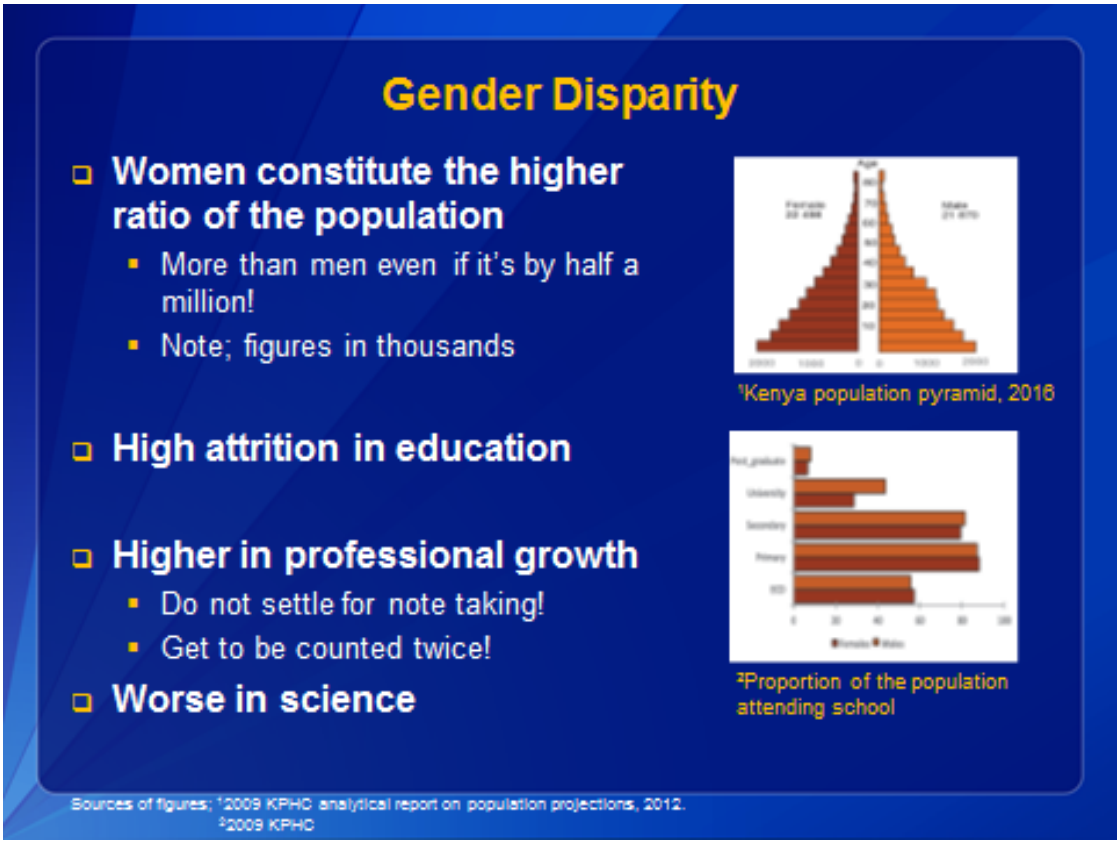
How do we do it?

Institutional Framework for Research Management

- **Infrastructure**
  - Hardware - Labs and incubations centers
  - Software - staff fully assigned to research
  - **Functional systems; impact on timelines**
  - Institutional bureaucracies – financial approval systems
  - Institutional review boards – new proposals/protocols, renewals
- **Mentorship and internship**
  - Updating the curriculum
  - Nurturing the true research culture
  - Embracing technology – you cannot use Epi info and expect to fairly compete with the world. R is open source!!!
- **Internal financing opportunities**

Partnerships and Collaborations

- Sourcing for alternative funding opportunities
- Building multi-disciplinary teams
- Linkages; Academia–Industry–Government



Integrity in Research

- **Right use of research funds**
- **Fraud and misconduct**
  - Fabrication (making up results)
  - Falsification (manipulating processes & results)
  - Plagiarism (stealing other's work)
  - Questionable research practices
    - Publishing pieces of research more than once
    - Failure to declare conflicts of interest
    - Selective reporting (omitting outlying data)
    - Including authors with little or no contribution on paper

Unethical Behavior: Who Does It and Why?

- Who:
  - Sponsors/funders, Investigators, Professors/lecturers, Support staff, Students
  - Why:
  - Peer pressure or pressure to succeed or publish
  - Unreasonable expectations
  - Financial rewards, greed
  - Justification of funding
  - Personal issues: ego, laziness, fatigue or incompetence

What can we improve on?

How Can We Reduce the Risk of Unethical Behaviour?

- Ensure study staff have adequate resources and support to perform their duties
  - This includes training
  - Encourage an open, honest research environment
- Don't place unreasonable demands on students and staff
- Monitor results and listen to what staff and students are saying

Use of Research Findings/products

- **Drive the agenda beyond publication**
  - Lobby for key stakeholder audience
- **Inform interventions**
- **Advice and evaluate policies**
  - Gap between policy and implementation
  - **Evaluate systems and products**

Sustainability of Research Activities

- **Explore private sector funding;**
  - Technology companies (Engineering, Laboratory sciences, Agriculture, Medicine, Social sciences)
  - Pharmas
  - **Make case and lobby for increased government funding**
- **Reach out for partnerships/collaborations**
- **Embrace technology**

"For us to cope in research, we need to strategically align ourselves to global trends. The time is now!"

Networks, technology, integrity.

REACTION (S) FROM THE PLENARY

The issue of maintaining research culture in University is a big challenge. Members of faculty should dedicate at least 50 percent of their quality time for research. There should be a deliberate move to relook at the legislative component to ensure it continuously supports research and innovation

TEAMWORK IN RESEARCH

By Prof. George Mark

He opted to share his experiences and he avoided to use PowerPoint presentation.

He gave the analogy of team work using the family model where the father provides the funds and the mother becomes the team leader to implement the family projects. Conversely, in families where the mother provides the funds the father becomes the implementer of the family projects.

He informed the participants to refer to their childhood experiences. At childhood one works alone . One does a one a man show.

Collaborative research is the most ideal form of research nowadays. He gave an example where there was a collaborative research which involved researchers from diverse institutions from Kenya, Uganda and Tanzania. The research was on the importance of indigenous vegetables. Some researchers were social scientist (a poet), an economist and a spatial planner.

There has to be a team leader who should coordinate the other researchers in the project. Ideally, Prof. George Mark advised that ideally it would be good to choose team which gels well and can draw their synergies and various acumen into the project.

He also observed that collaborative research has three pronged phases:

- The research itself
- The private sector input
- The policy

He advised that ideally good research should entail the following :

- A well-developed research proposal
- The brainstorming sessions during the planning phase should be done in a conducive environment.
- Working across time-zones if the researchers are in the different part of the globe there could be challenges in the harmony on how they can pool their ideas together to realize the project proposal.
- The implementation team should display honesty and diligence.
- The research assistants should be students or former students who are diligent, disciplined and trustworthy

'BEST PRACTICES IN RESEARCH' FOR QUALITY OUTPUT IN KENYAN UNIVERSITIES

By Dr. Charles O. Ochieng

Outline

- Research trends in Africa-Kenya
- Challenges
- Research quality parameters
- Best practice
- Assessment of research quality
- Research misconducts

Does Africa have Research Universities?

NO:

According to Altbach and Balán (2007) on their book, *World Class Worldwide* discussing the transformations of research universities in Asia and Latin America.

REASON:

That Africa's academic challenges are completely different from the rest of the world

My TAKE:

NO empirical evidence for such assumptions

Since

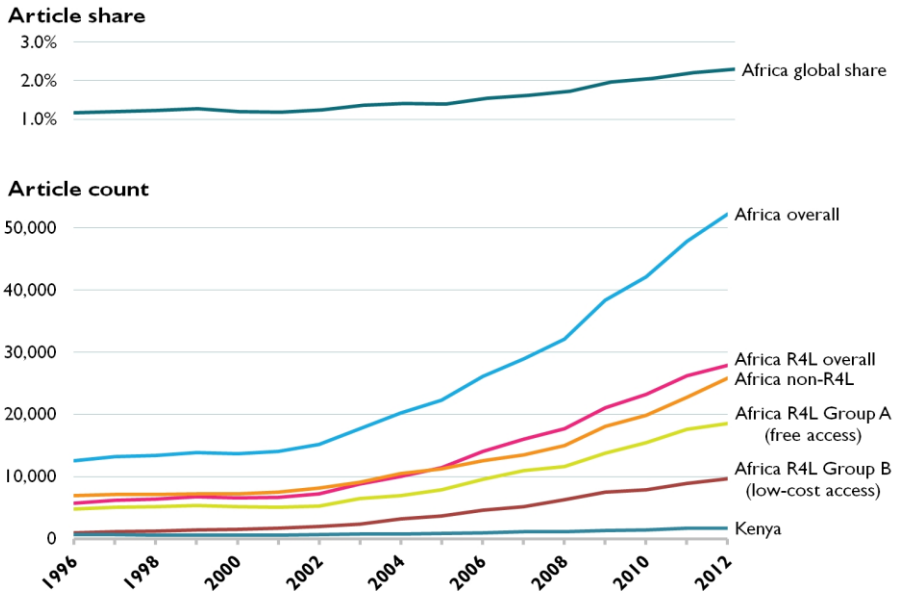
Over the years, several African universities have appeared in the top 500 main Global ranking systems.

- e.g Cape Town, Witwatersrand, Kwazulu Natal, Stellenbosch (SA) and Alexandria (Egypt)

What are Global ranking systems based on?

quality or quantitative

Either way quantity provides the basis for quality assessment.


Article share
3.0%
2.0%
1.0%
Africa global share
Article count
50,000
40,000
30,000
20,000
10,000
0
1996
1998
2000
2002
2004
2006
2008
2010
2012
Africa overall
Africa R4L overall
Africa non-R4L
Africa R4L Group A
(free access)
Africa R4L Group B
(low-cost access)
Kenya


Don't be too obsessed with
this whole status thing in publication.

Africa's performance on the global research and science stage is still not encouraging.

Since Africa lags behind on key indicators such as:

- The gross domestic expenditure on R & D
- Number of researchers
- Share of Scientific publications and patents (Zeleza, 2014)'

A critical mass of qualified researchers is key.

Does Kenya have the critical mass dedicated to research?

In a study conducted by CPS RESEARCH INTERNATIONAL, (2018)

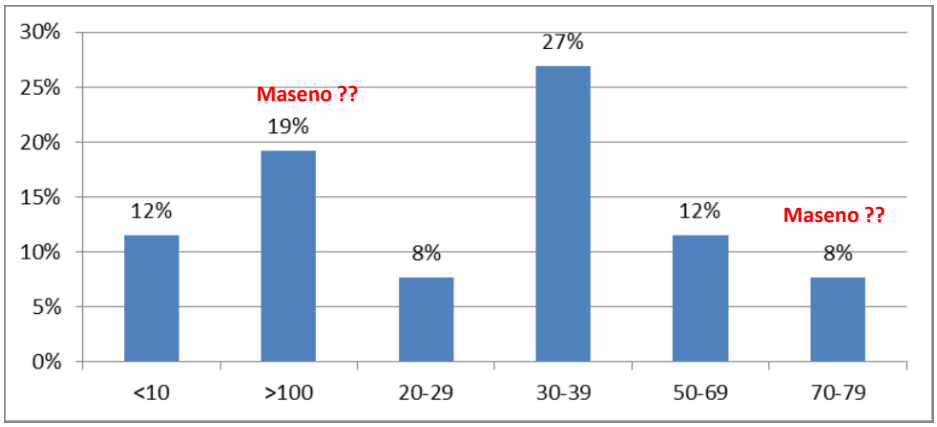


Figure 2: Institutions' Total number of academic staff with Masters & PhD with bias to research

Out of those numbers with Master and above, how many are fully dedicated to research?

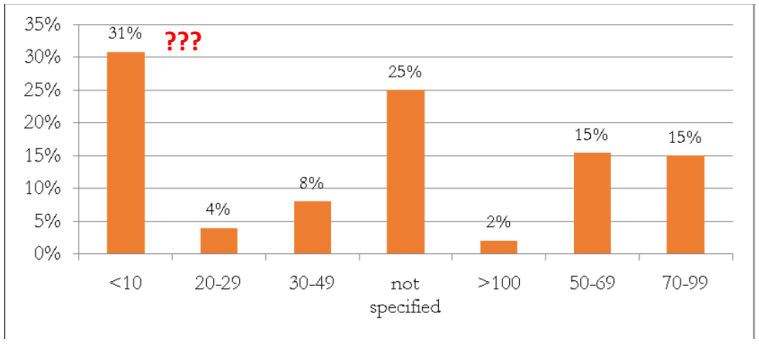
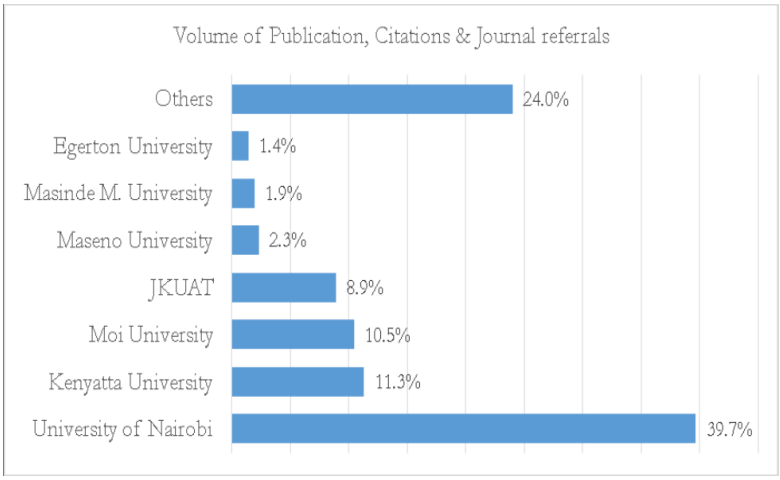


Figure 3: Number of staff (academic & non-academic) fully dedicated to research

So what is the output from the Key public Universities in Kenya?



Obvious Speculation
Research funds to has a great impact on the number of publications, citations and academic journal referrals

There is a correlation between volume of research and volume of publications

Publication of academic and research papers plays a central role in attraction and access of funds
Promotes scientific literacy

Figure 4: Volume of Publication, Citations & Journal Referrals of Kenyan Universities

Best practices imparts quality in research

So What is Quality research?

Quality research encompasses all aspects of study design ranging from the judgment regarding the match between the methods and questions, selection of subjects, measurement of outcomes, and protection against systematic bias, non-systematic bias, and inferential error (Boaz & Ashby, 2003; Lohr, 2004; Shavelson & Towne, 2002).

The standards for quality of research to large extent may depend on the **philosophy** and the **research methods**.

Standards for qualitative research may not be exactly the same as for quantitative.

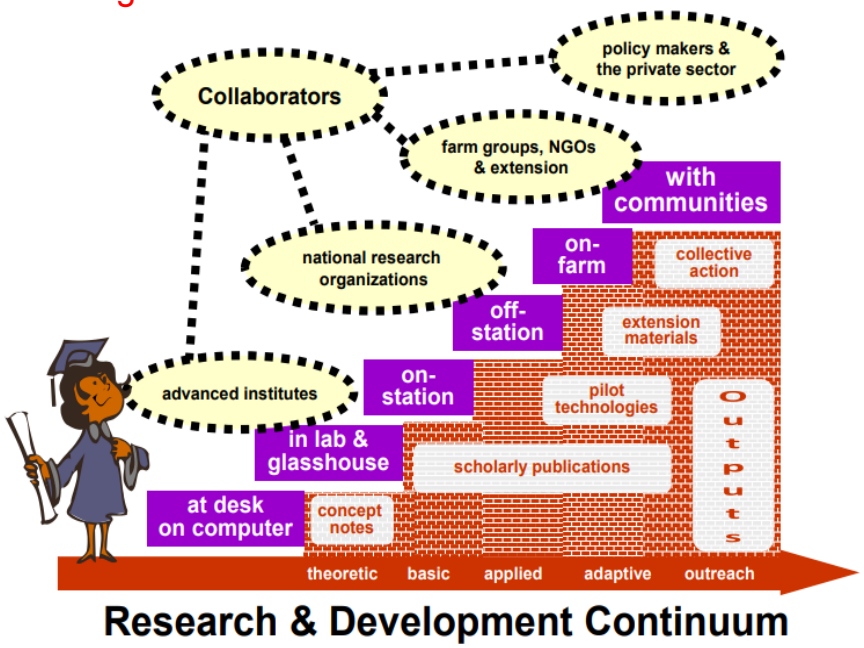
Qualitative		**Quantitative**
• credibility	parallels with	• Internal validity
• transferability	parallels with	• External validity
• Dependability	parallels with	• Reliability
• Confirmability	parallels with	• Objectivity

(Boaz & Ashby, 2003)

Standards for quality research, should emphasize;

- Objectivity
- Internal validity
- External validity
- Reliability
- Rigor
- Open-mindedness
- Honest and thorough reporting (Ragin et al., 2003; Shavelson & Towne, 2002)

Quality of research begins with the researcher



For quality research, the following determinants are Key for Kenyan Universities:

- Qualified staff to conduct and supervise research projects.
- Laboratories and incubators for experimentation.

To attract funds to support the research units:

- Reputable researchers to apply for funds
- Availability of research team
- Quality of the university infrastructural systems.

Principles Standards for assessing the quality of research include:

- Pose a significant research question, can be investigated empirically and that contributes to the knowledge base.
- Test questions must be linked to relevant theories.
- Apply methods/approaches that best address the research questions of interest.
- Clear chains of inferential reasoning supported by a complete coverage of the relevant literature.
- Provide the necessary information to reproduce or replicate the study.
- Ensure the study design, methods, and procedures are sufficiently transparent and ensure an independent, balanced, and objective approach to the research

Principles Standards

- Provide sufficient description of the sample, the intervention, and any comparison groups.
- Use appropriate and reliable conceptualization and measurement of variables.
- Evaluate alternative explanations for any findings.
- Assess the possible impact of systematic bias.
- Submit research to a peer-review process.
- Adhere to quality standards for reporting (i.e., clear, cogent, complete)

A research studies should respond to most of these principles for a higher the quality.

Achieving only one or two standards is typically insufficient to assert quality

However, there is no consensus on a specific set or algorithm of standards that will ensure quality research.

Who sets the standards???

- Consensus among a community of scholars (common knowledge and expertise) is one of the most respected means of quality assessment.
- Through
    - position statements,
    - conferences,
    - congress meetings,
    - the peer review process, and systematic review
    - Bibliometric analysis is another quality assessment strategy, the citation of research by other authors (Peer acknowledgement)
        - Although, it is a faulty assumption that all "research" that is published in journals or cited by others is accurate, reliable, valid, free of bias, non-fraudulent, or of sufficient quality (Boaz & Ashby, 2003).
- Bibliometric analysis is primarily a measure of quantity and can be artificially influenced by journals with high acceptance rates (COSEPUP, 1999).

Standardized Reporting of Research as a way to assess research quality

Apart from the basic IMRAD framework for general scientific reporting,

Another form of consensus to assert quality is standardized reporting of research output

Quality assessment is often poor; suppose essential information are missing in the report such as:

- Regarding samples
- Statistics
- Analysis, or interventions.
- These essential information vary with methodology and specific research designs.

What are the standard **best practices**???

a. Research integrity

b. Research design

c. Sharing of research output

d. Training and mentoring aspects

e. Promotion of research culture

f. Maximizing the impact of research

Lack of adherences leads to **research misconduct/Integrity deficiency**

Research Misconduct, and its Consequences

- Significant departure from accepted practices of the scientific community (falling short of good ethical and scientific standards)
    - Including fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.
- Damages the scientific enterprise, is a misuse of public funds, and undermines the trust of the public in science.
- Remedial measures largely depend on clarity and consistency in defining the misconduct by the administrative system.

Categories of research misconduct

1. Core "Research Misconduct" FFP

- **F**abrication of data
- **F**alsification of data
- **P**lagiarism
    - Selectively excluding data from analysis
    - Misinterpreting data to obtain desired results (including inappropriate use of statistical methods)
    - Doctoring images in publications
    - Producing false data or results under pressure from a sponsor

2. Research practice misconduct (violation of ethics)

- Using inappropriate (e.g., harmful or dangerous) research methods.
- Poor research design Experimental, analytical, computational errors.
- Violation of human subject protocols.
- Abuse of laboratory animals.

Categories of research misconduct

3. Data-related misconduct

- Not preserving primary data.
- Bad data management, storage.
- Withholding data from the scientific community.

NB: The above applies to physical research materials as well

4. Publication-related misconduct

- Claiming undeserved authorship.
- Denying authorship to contributors.
- Guest authorship
- Artificially proliferating publications ("salami-slicing").
- Failure to correct the publication record.

Categories of research misconduct

5. Personal misconduct

- Inappropriate personal behaviour, harassment
- Inadequate leadership, mentoring, counselling of students
- Insensitivity to social or cultural norms

6. Financial, and other misconduct

- Peer review abuse e.g., non-disclosure of conflict of interest, unfairly holding up a rival's publication.
- Misrepresenting credentials or publication record.
- Misuse of research funds for unauthorised purchases or for personal gain.
- Making an unsubstantiated or malicious misconduct allegation.

Options for Dealing with Research Misconduct Allegations

- *Ad-hoc* committees established to deal with specific cases.
- Standing committees in research institutions
    - standing entities (offices, officers, committees) and corresponding procedures, at the level of the institution
- One or more dedicated committee(s) at the national level

RAT 1

Case Three: Haven't I Seen that Protocol Before?

After his medical residency, Dr. Jalang'o Sibuor decides to go into academic research. Jalang'o receives some startup funds from Prof. Shirandula, his advisor and clinical liaison, and begins to delve deeply into the literature to formulate his own ideas around some novel uses of a drug that is currently on the market. He writes a complex investigator protocol which he thinks is very good. He asks Prof. Shirandula and another colleague, Dr. Otoyo, to read and critique his full proposal.

A month later, Dr. Otoyo, calls Jalang'o. "Hate to tell you, but Prof. Shirandula just submitted a research proposal identical to yours as part of a large National Research Fund grant that the institution is tendering," he says. "I know it is yours because I edited it." Jalang'o can't believe his ears. His colleague says, "Unfortunately, I'm afraid the administration will pull your protocol and say it's in the best interests of the organization to have someone of his stature submit the protocol, not you."

Jalang'o is flabbergasted. He'd done all the hard work of devising the protocol, not Prof. Shirandula. At this point, Miguel feels so discouraged, powerless, and defeated that he wishes he were back in clinical practice and forget research.

What should Jalango do?

Discussion Questions for the Facilitator

1. If Jalango could prove that the work is his, do you think he could recover control of his protocol?
2. Who would he discuss the problem with?
3. How should Dr. Otoyo respond in this matter?
4. How might Jalango assess whom in the administration to trust with a complaint about the professor?

5. Why might the university prefer to have a senior investigator submit an innovative research proposal instead of a junior investigator?

6. What are some subtle take-away lessons gleaned from this case?

Case Two: Struggling to Understand Plagiarism

Patrick has a PhD student, Elizabeth (Liz), who comes to the program after finishing medical school in her native country, Cameroon. Hua plans to return after receiving her PhD and because she plans to practice genetic medicine, she is not too concerned at her poor ability to write in English.

For her exam, Liz submitted a review paper on gene duplication as a cause of disease. Her review had a title which sounded familiar to Patrick and the English was far better.

Patrick asked Liz if she had used any review articles in preparation of her own review article to which Liz confirmed. So Patrick insist that Liz to cite the articles she read. To Patrick relief, Liz came back with some citations added to her review article. Patrick went to the library and did a search. He found an article with the same title.

In the meantime, Liz barely passed her preliminary exam. A week later, Patrick got a copy of the journal article – 80% of Liz's paper had been copied verbatim.

Pamela reported her finding to the Departmental Committee. A debate ensued as to whether to report this to the School of Graduate studies, or to make a departmental determination of how to respond to Liz's plagiarism.

How should the committee respond to Liz's alleged plagiarism?

Discussion Questions for the Facilitator

1. Should the department decide how to handle Liz's plagiarism or should they turn the case over to the Dean of Graduate Studies?

2. What, if anything, should the department have taught their students about scientific writing and the nature of review articles?

3. Should Liz be expelled from the program or given a second chance to complete her degree? *

4. Do you think it is "sympathetic" or rather "insulting" to ask if culture may have contributed to Liz's actions?*

5. Are there any circumstances in which this matter would need to be reported to the university research integrity officer or to the Office of Research Integrity?

6. Should all doctoral students be expected to know basic standards of research integrity?

There are several standardized formats for general and specific research designs, including the following:

1. **CONSORT** (Consolidated Standards for Reporting Trials): a 22-item checklist for reporting simple two group, parallel, randomized controlled trials (Moher, Schulz, & Altman, 2001). Available at http://www.consort-statement.org/ statement/revisedstatement.htm.

2. **QUOROM** (Quality of Reporting of Meta-Analyses): a 17-item checklist for reporting systematic reviews (Moher et al., 1999). Available at http://www.consort-statement.org/ QUOROM.pdf.

3. **MOOSE** (Meta-Analysis Of Observational Studies in Epidemiology): a 35-item checklist for reporting observational studies (Stroup et al., 2000). Available at http://www.consort-statement.org/

4. **TREND** (Transparent Reporting of Evaluations with Nonrandomized Designs): a 22-item checklist for nonrandomized designs (2004). Available at http://www.trend-statement.org/asp/documents/ statements/AJPH_Mar2004_ Trendstatement.pdf.

5. **STARD** (Standards for Reporting of Diagnostic Accuracy): a 25-item checklist for diagnostic test accuracy (STARD, 2001). Available at http://www.consort-statement. org/stardChecklist.PDF

6. **STRICTA**: Standards for Reporting Interventions in Controlled Trials of Acupuncture to acute ischemic stroke (Higashida, 2003; MacPherson et al., 2002).

However, the checklists may not be appropriate for research designed to generate qualitative data as being overly prescriptive

Boaz, A., & Ashby, D. (2003). Fit for purpose? Assessing research quality for evidence based policy and practice. London: ESRC UK Centre for Evidence Based Policy and

Practice.

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Moher, D., Cook, D. J., Eastwood, S., Olkin, I., Rennie, D., & Stroup, D. F. (1999). The Lancet, 354, 1896–1900.

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REACTION(S) FROM THE PLENARY

Supervision of postgraduate students undertaking Masters and PhD Programs is part of research and should be taken very seriously. The volume of publications from the research findings provides quality research outputs.

ATTITUDES THAT PROMOTE QUALITY RESEARCH (ROLE OF THE RESEARCHER)

By Prof Mathews M. Dida,

Department of Applied Plant Science.

Presentation outline

- Sociological definition of Attitude
- Attitude and Behaviour
- Behavioural Science principles for service encounter management (Customer/client management)
- Positivity and research
- Games theory and societal applications

Attitude

- Attitude is relatively stable overt behavior of person which affects his status (Bain, 1927-28).
- Attitude is a status fixing behavior, that differentiate it from habit and vegetative processes.

Attitudes and Behavior

- An attitude is "a relatively enduring feelings, and behavioral tendencies towards socially significant objects, groups, events or symbols“ (McLeod S, 2018).
- Attitudes structure can be described in terms of three components./the ABC model of attitudes

Structure of Attitudes

- **Affective component**: this involves a person’s feelings / emotions about the attitude object. For example: “I am scared of spiders”.
- **Behavioral** (or conative) component: the way the attitude we have influences how we act or behave. For example: “I will avoid spiders and scream if I see one”.

- **Cognitive** component: this involves a person's belief / knowledge about an attitude object. For example: "I believe spiders are dangerous". (Source: McLeod S, 2018)

- **Knowing a person's attitude helps us predict their behavior. For example, knowing that a person is religious we can predict they will go to Church.**

Behavioural Science principles for service encounter management (Customer/client management)

- **The Five Operating Principles (Chase and Dasu, 2001) Harvard Business Review**

1. Finish Strong: the beginning and end of an encounter- stating that the end of an encounter is strongest in customer recollections.

2. Get the Bad Experiences Out of the Way Early: Research reveals that people prefer to have undesirable events come first in order before the desirable ones. That service providers, should prefer delivering bad news, getting the pain and discomfort out of the way first, "so they don't dominate the customer's recollection of the entire experience" .

3.Segment the Pleasure, Combine the Pain: This principle is translated from duration effects: an experience will seem longer if broken up into sections. The authors say breaking up the pleasurable aspects of an encounter will likely make the overall encounter seem better to the customer when the negative aspects are combined.

4. Build Commitment Through Choice: When experiencing any sort of process, people are more comfortable when they feel some control. Giving customers more choices creates a better service encounter.

5. Give People Rituals, and Stick to Them: People find "comfort, order, and meaning in repetitive, familiar activities".

Positivity (positive attitude) and research

- "Positive thinking means approaching life's challenges with a positive outlook.

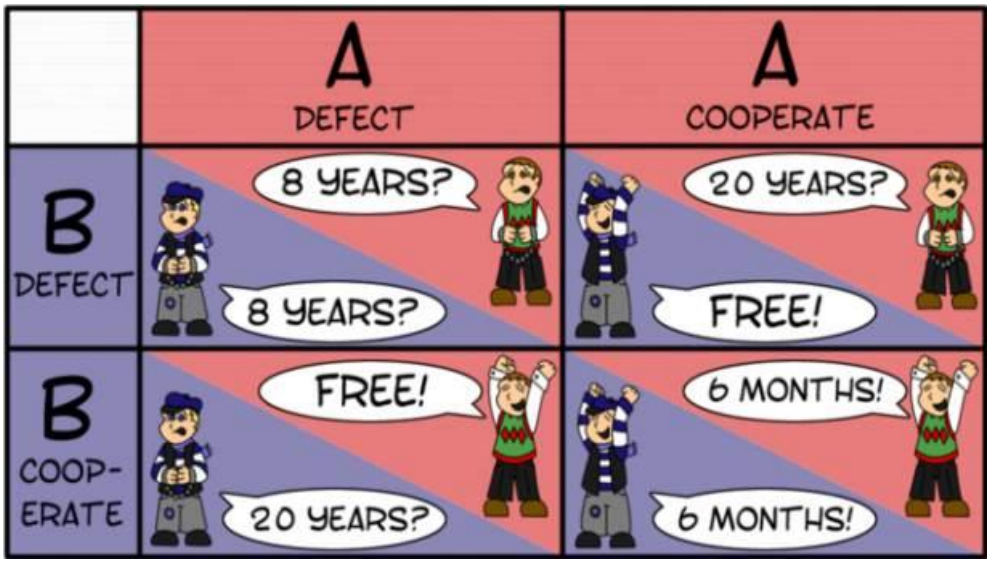
- It does not necessarily mean avoiding or ignoring the bad things; instead, it involves making the most of the potentially bad situations,

- trying to see the best in other people, and viewing yourself and your abilities in a positive light."

Traits and Characteristics associated with positive mindset

- **Optimism:** a willingness to make an effort and take a chance instead of assuming your efforts won't pay off.
- **Acceptance:** acknowledging that things don't always turn out how you want them to, but learning from your mistakes.
- **Resilience:** bouncing back from adversity, disappointment, and failure instead of giving up.
- **Gratitude:** actively, continuously appreciating the good things in your life.
- **Consciousness/Mindfulness:** dedicating the mind to conscious awareness and enhancing the ability to focus.
- **Integrity:** the trait of being honorable, righteous, and straightforward, instead of deceitful and self-serving.

Games theory/ Prisoner's dilemma



The 'Nash Equilibrium'

- Mathematician John Nash showed the following:
- in non-cooperative games there exists an equilibrium at which no side has any rational incentive to change the chosen strategy even after running through all the choices available to the opponent(s).
- John Nash showed that important economic, political or social interactions can be hinged on desirable outcomes without the need for any contracts.

PROF. MATHEWS DIDA - ASTUTE RESEARCHER ON MAIZE WEED STRIGA

REACTION(S) FROM THE PLENARY

Having a "positive thinking" denotes approaching life's challenges with a positive outlook

Kenya Industrial Property Institute.

Promoting Research Excellence for Sustainable Development : Role of Intellectual Property Rights/System

Venue: Kisumu Hotel
Date: 6th June 2019

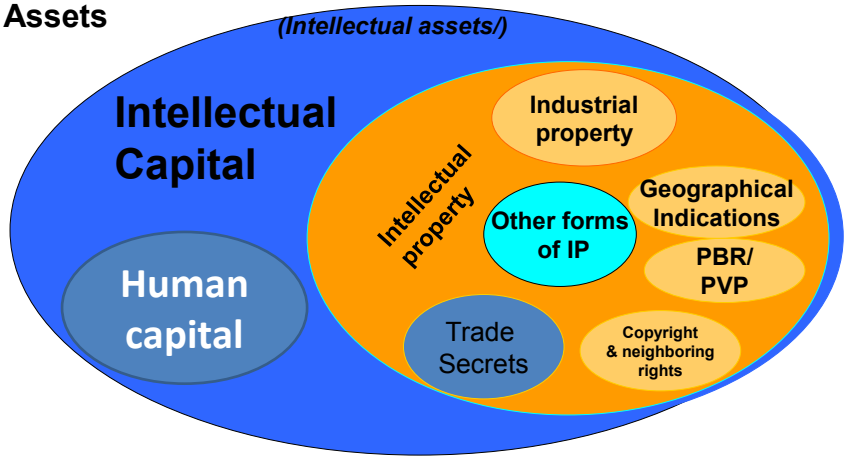
Presented by:
Paul M. Chege
Assistant Manager - Patents
KIPI

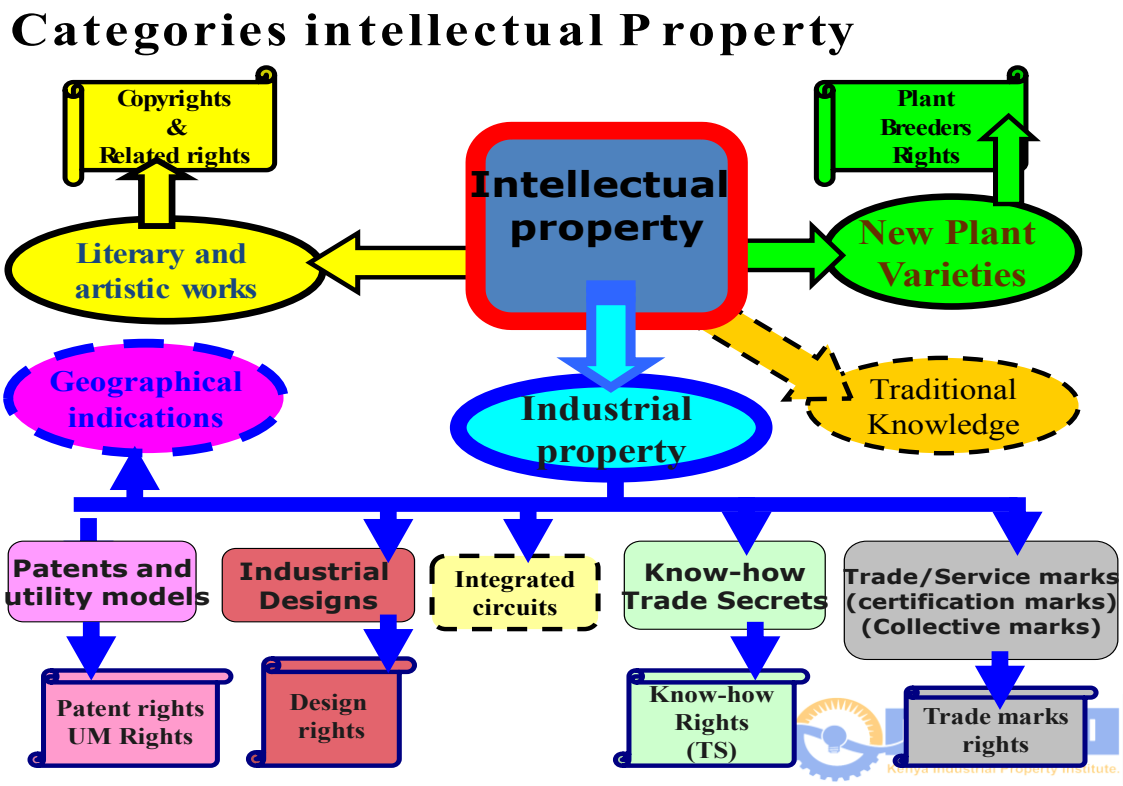
Contents

- Knowledge Economy
- Introduction and overview of Intellectual Property Rights
- Role of Intellectual Property in R&D
- Need for IP management System in Universities and other R&D institutions
- Technology and Innovation Support Centre (TISC) Project.

Introduction: Knowledge Economy

Intellectual capital > 80% of progressive organizations' Assets





Why Protect Intellectual Property?

- Need to stimulate creativity and inventiveness in the society, which are in fact decisive factors in the social, economic and cultural development of any nation;
- Need to give protection to the considerable investments which are necessary for the creation and dissemination of works of the mind and of, for instance, complicated pharmaceutical substances and medicines;
- Need to give some recognition of, and protection for, the moral interests of those who invent and create against other persons' misappropriation of the results of their creativity.
- Fosters economic growth
- Provides incentives for technological innovation
- Attracts investment that will create new jobs and opportunities.
- creates incentives for individuals and firms to commercialize inventions and other creations

  -by allowing individuals and firms to profit from their creative activities.

Need for IP management

- Kemron Case.
- Nairobi University Vs Oxford University
- The Ruiru Microbe (medicine for the management of diabetes)

Prudent management of intellectual Property is essential for a progressive research organization. It helps avert the the problems witnessed in the above cases.

What you can do with IP?

- Sell (Assign)
- Rent/lease (Licence)
- Donate
- Inherit
- Collateral (security)

What can you achieve with proper IP management?

- Leverage
- Attract partners/collaborators
- Attract investment and financing
- Earn new revenue streams
- Reinvent your business model

TISC Project

- WIPO Initiative.
- Address the Knowledge gap between the developed Countries vs developing and least developed countries
- Provide access to a broad range of technological and scientific information at very minimal cost.
- KIPI – The focal Point for the establishment of the Kenyan TISC Network.
- Institutions already in the TISC Network:
  - UoN, TUM, KU, JKUAT, JOUST, SNP, SIST, AFRALTI, KarU, UoE

For More Information

- **Visit**
  - **www.kipi.go.ke**
  - **www.wipo.int**
  - **www.epo.org/index.html**
  - **www.uspto.gov**

And many other IP offices websites/portals

REACTION(S) FROM THE PLENARY

The Universities should explore the possibilities of subscribing to the membership of Technology and Innovation Service Centre. The center provides training on how to obtain reading materials from various IP centres. The cost of obtaining technological and scientific information is very minimal.

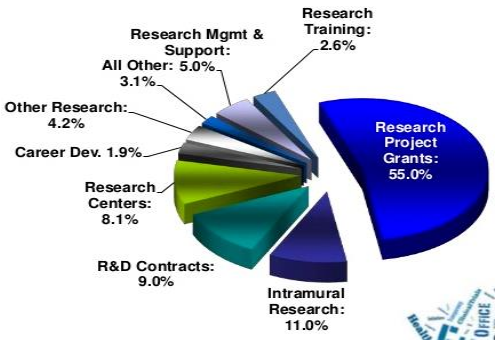
Research Grants Proposal Writing
-a personal perspective

Paul Mireji, PhD
(YSPH/KEMRI-Wellcome Trust/BioRI-KALRO)
Maseno University Conference on Research Capacity Building
Promoting research excellence for sustainable socio-economic development
June 6, 2019, Kisumu Hotel.

What is the funding mechanism?

<u>NIH</u>-International Research in Infectious Diseases, including AIDS (R01)

Corporate strategy, mission, vision and values, policies and statement (website)



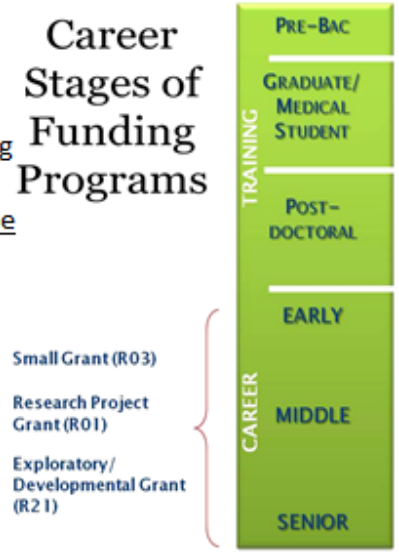
What is the broad scope and eligibility criteria for the call?

- ....applications from organizations/institutions in eligible foreign countries that propose research related to infectious diseases that are of interest/importance to that country.
- **Read and read and internalize the call…**
  - ***Applications that do not comply with …. instructions may be delayed or not accepted for review***

Is this call appropriate for my career stage? Do I meet the requirement?

….serve to build independent research capacity by providing direct funding … to advance development of local scientific expertise…topic of interest including vectors and vectorborne diseases…,within the applicant country… .development of basic …research capacity is encouraged.

Can I consult with program officer?



Do I have sufficient time to respond to this call?

....preliminary data is not required, but is encouraged.... letters of support/commitment, Bio-sketches, resources are required.....ethical approval, IP, code of GRP...data protection and confidentiality ...indemnity ...internal deadlines

What is the assessment process? How long does it take?

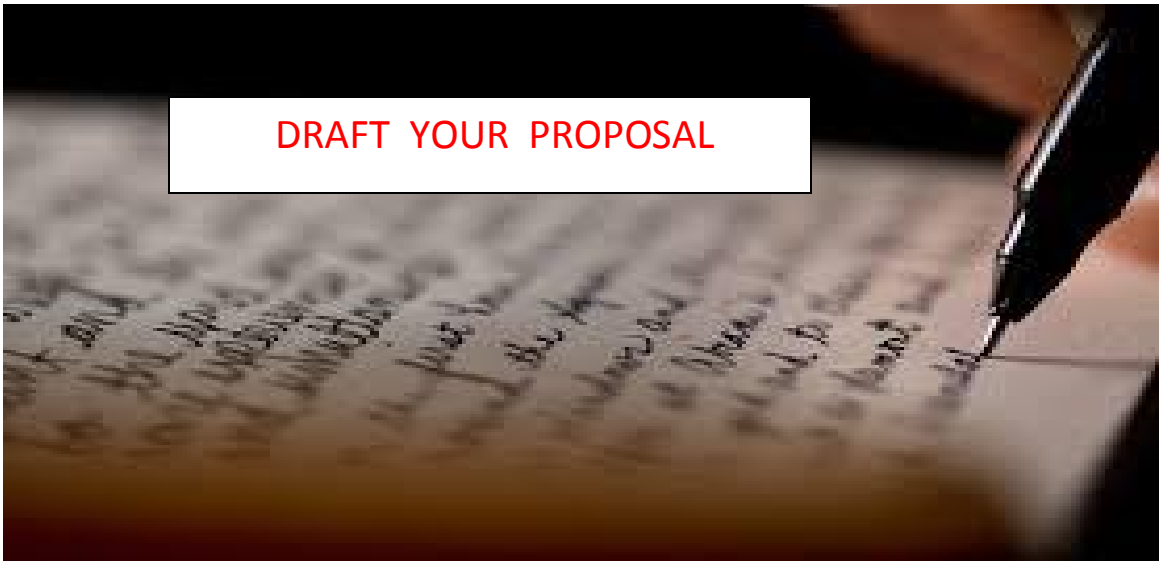
Submission –> eligibility-> peer review –> funding recommendation –> board approval –> feedback.

- Key Dates
  - Posted Date: January 27, 2017
  - Open Date (Earliest Submission Date): April 22, 2017
  - Application Due Date (s):May 22, 2017
  - Letter of Intent Due Date (s) April 22, 2017
  - Scientific Merit Review: October 2017
  - Advisory Council Review: January 2018
  - Earliest Start Date: March 2018
  - Expiration Date: August 23, 2019

What specific skills (team) and equipment will I need (collaborators)?

Chemical ecology, genomics, immunologist, - Bio-sketches (Benson, Collins....)
GC-MS, Illuminar Sequencer, ElISA – Institutions (CDC, KWS...)

- **What will the funding cover?**
  - ...money, property, or both to an eligible entity to carry out an approved....
- **What applications are accepted?**
  - New, Renewal, Resubmission, Revision.
- **What are the odds of success?**
  - ....number is contingent upon appropriations and submission of sufficient meritorious applications.
- **What are the budget limits?**
  - Applications may request a budget of up to $125,000 per year in direct costs and a maximum of $625,000 direct costs over a five year project period.
- **For how long?**
  - The scope of the proposed project should determine the project period. The maximum project period is 5 years.



Self Assessment!!

- **How will my proposal probably score?**
  - Significance
  - Investigators (team)
  - Innovation
  - Approach
  - Environment
- **What will be the overall impact of my project?**
  - Will your project exert a sustained, powerful influence on you research field(s)?

What is the ***significance*** of your project?

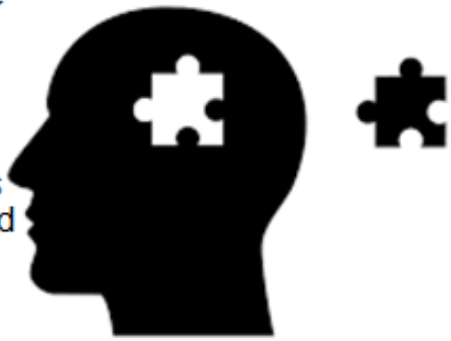
- Does your project address an important problem or a critical barrier to progress in your field?
- Do you have strong scientific premise for the project?
- If the aims of your project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved?
- How will successful completion of your aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field?
- Have you demonstrated that the scientific question is of importance to the country/region in which the research will be conducted?

Do your ***investigator(s)*** have the skill sets and experience to deliver?

- Are you and your collaborators well suited to the project?
- Do they have appropriate experience and training (early stage) or demonstrated ongoing record of accomplishments that have advanced their field(s) (established stage)?
- Do your investigators have complementary and integrated expertise?
- Is your research team as proposed likely to develop scientific capacity and infrastructure at the foreign institution?

What *innovation(s)* will your project introduce?

- Does your application application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions?
- Are your concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense?
- Is your refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?



Is your *approach* appropriate to accomplish the set objectives?

- Are your overall strategy, methodology, and analyses well reasoned and appropriate to accomplish the specific aims of the project?
- Have you presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?
- Are you presented potential problems, alternative strategies, and benchmarks for success?
- Will your strategy establish feasibility and will particularly risky aspects be managed?
- Have you presented adequate plans to address relevant biological variables?
- Have you sufficiently developed collaboration plans?
- What is the likelihood that your collaborations will advance the development of local scientific expertise, build local research infrastructure or increase collaborative research partnerships?

Does the *environment* have sufficient and appropriate infrastructure?

- Will the scientific environment in which your work will be done contribute to the probability of success?
- Are the institutional support, equipment and other physical resources available to the investigators adequate for the project proposed?
- Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

Is your proposal calibrated for your reviewers and audience?

- Address significance, investigators, innovation, approach and environmental shortfalls..
- Edit the the proposal for your audience...
  - Convince **experts** in your field (reviewers) and **a mixed audience** from a variety of scientific backgrounds (the panel).
    - Prepare summery for laypersons...**can be deal beaker!**
    - Avoid abbreviations and acronyms and jargons.
- Proofread with colleague, confirm readability.
- Finalise budget issues with your institution
- Submit clean versions (proposal and budget)

What is the review outcome?*

	Critique					
	Proposal A			Proposal B		
Component	First	Second	Third	First	Second	Third
Significance:	4	1	1	5	4	2
Investigator(s):	3	1	1	3	3	2
Innovation:	3	1	1	5	5	4
Approach:	4	2	1	9	5	4
Environment:	1	1	1	3	3	2

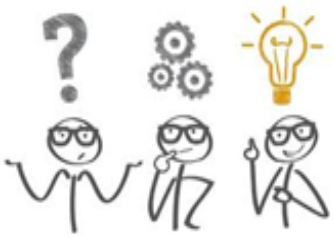
Impact/Priority		
Impact	Score	Descriptor
	1	Exceptional
High	2	Outstanding
	3	Excellent
	4	Very Good
Moderate	5	Good
	6	Satisfactory
	7	Fair
Low	8	Marginal
	9	Poor

- **Impact Score:** 12 Not scored

*- Actual outcomes of our applications to NIH for funding

Not Funded?

- **Re-submit**
  - Write clear, succinct and comprehensive rebuttal..
  - Acknowledge and address all significant concerns and/weaknesses described in feedback
  - Clearly explain disagreements and consequences of accommodating some of the feedback
  - Be civil....avoid coming across as argumentative or overly defensive.



You will get funded if you…

1. Carefully read and followed the directions of the call.
2. You pick an important research question.
3. You use the right method to answer it.
4. You write a short, clear account of the study that follow a tight structure and use effective writing to convey your message clearly.
5. Write the application with your reviewers and the audience in mind.

Looking for collaborators… *are you available..!?*

- **NIH –FIC - Global Infectious Disease Research Training Program (GID)**
  - A D43 funding mechanism…

- <u>Strengthening Vector Biology Research Capacity in East Africa</u>

<u>Aims:</u>

1. Empower early-career researchers and mentors in East Africa.
2. Maintain a rigorous pipeline of VB trainees.
3. Enhance VB curriculum.

- External resources and sources?
  - https://researcheracademy.elsevier.com/research-preparation/funding/secure-funding-ecr-edition
  - https://grants.nih.gov/grants/guide/pa-files/par-17-142.html

Get in touch?

- Mireji.paul@gmail.com
- peterpaul.mireji@yale.edu
- paul.mireji@kalro.org

REACTION(S) FROM THE PLENARY

The donor interests should be taken care of when developing proposals for funding. This is because the donor controls the funds. Thus, the onus is upon the researchers to adhere to the rules and regulations provided for in the call for proposals. The budding researchers are encouraged to strive at all times to submit quality proposal that would attract funding.

RESEARCH GRANT MANAGEMENT

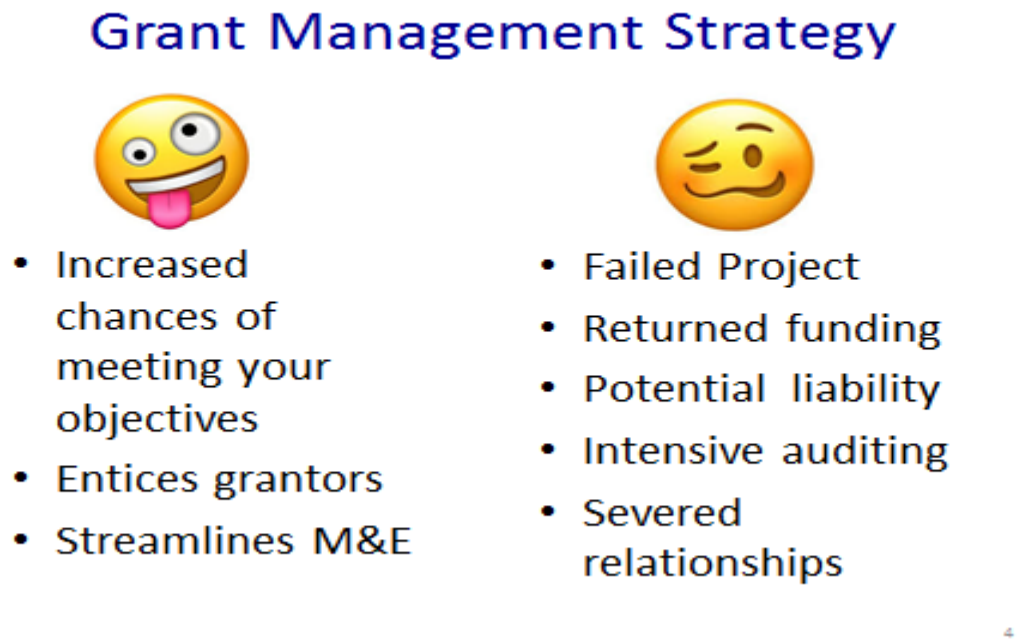
By Dr. Benson Nyambega

Scope of presentation

- What is it? ....0.5'
- Phases of a Grant process...1'
- Grant Management....10'
- Keys to successful grant management.....1.5'
- Technology/Software for Grant management...2'

Grant Management

The phase of the grantsmanship process that begins when an applicant signs an agreement with a grantor (funder) to accept a grant award and becomes a **grantee...WE GOT FUNDED...!!**



THE PHASES IN THE GRANT PROCESS

- Pre-award Phase: Identification of the kinds of funding sources that will support your research strategy and programs.
- Award Phase: Notification and announcement of the grants you receive.
- Post-award Phase: (1) Implementation, (2) Reporting

GRANT MANAGEMENT STRATEGY?

A grant management strategy: streamlines the grant process by helping you

- **Identify prospective funders**,
- **Track the success of proposals**,
- **Monitor the progress of each grant**, and
- **Gather the information you need for each report**.

1) Implementation, (2) Reporting

(a) Develop a Work Breakdown Structure (WBS). One of the most important elements of project management.

- An outline of all the work to be performed.

It helps **schedule the project and its components, estimate resources, assign responsibilities > <u>control the project</u>**

A Work Breakdown Structure

Project: Investigate the possible role of Sumacan in prostate cancer

Activity: Determine whether there is a difference in Sumacan expression between normal and cancer cells of the prostate.

Events:

- Determine the difference in RNA expression
- Determine the difference in protein expression
- Determine the relationship between RNA expression and protein expression

(b) Develop a Project Schedule

- Outlines the order in which activities are to be performed, including estimates of how long each activity will take.
- To effectively schedule your activities:

  > Identify activities and events from WBS.

  > Identify constrains

  > Determine duration for each activity

  > Decide on order of execution

  > Develop an initial schedule/Revise the schedule as appropriate

Tools for developing Schedules

- Activities Plan
- Key events schedule
- Gantt chart
- Loading chart
- PERT chart

Activities Plan

Activity/Person(s) Responsible/Start Date/End Date

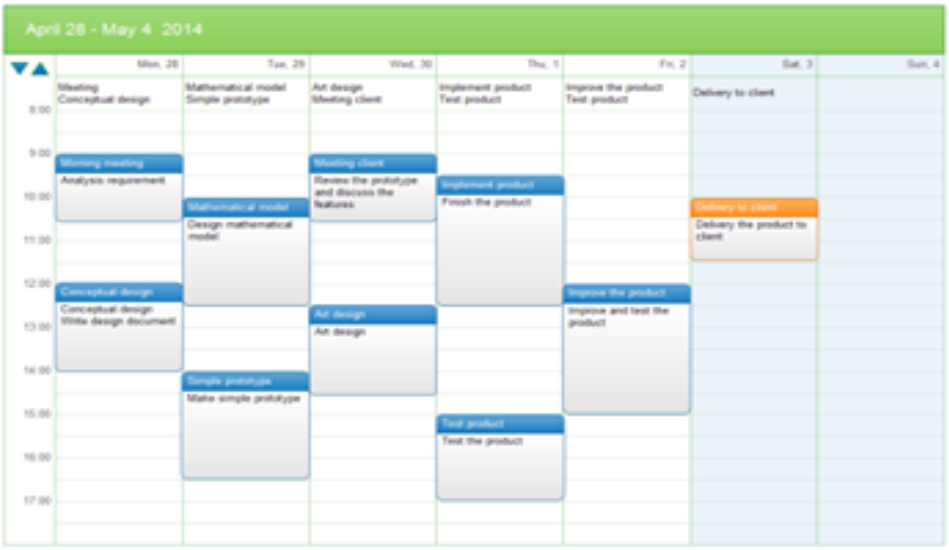
Determine the difference in RNA expression/Teresa and Robert/October 26/November 5

Determine the difference in protein expression/Teresa and Robert/October 26/November 5

Determine the relationship between RNA expression and protein expression/Robert/November 6/November 8

Events Schedule

Shows events and target dates for their completion (Milestones for one or more activities)



https://www.edrawsoft.com/template-weekly-task-schedule.php

Gantt Chart

Graph with horizontal bars showing Start date/Duration/Person responsible

Project: Role of Sumacan in prostate cancer												
Activity	November				December							Responsibility
Isolate RNA and Protein	x	x										Teresa
RT-PCR and Western blots		x	x	x								Robert
Compare results				x	x							Teresa and Robert

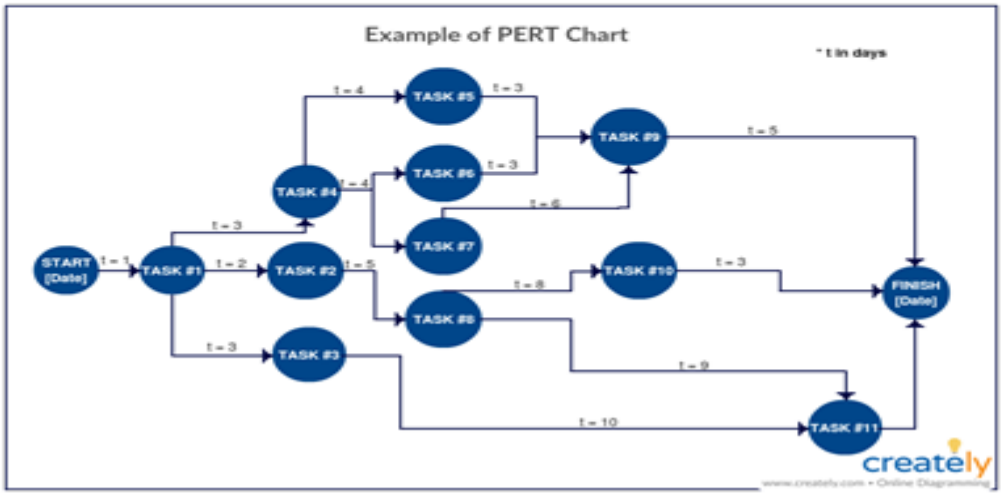
Loading Chart

WEEKS	1	2	3	4	5	6	7	8
RESEARCH HOURS	20	18	20	18	20	18	20	18
TEACHING HOURS	15	15	15	15	15	15	15	15
TOTAL TIME	35	33	35	35	35	33	35	33

14

Programe Evaluation Review Technique (PERT) Chart

Used to organize, schedule task in a project.



15

(1) Implementation, (2) Reporting

Monitoring & Evaluation

- Constitutive part of every project.

- Involves stakeholders e.g. the recipient, implementing institution, funding institution.

Monitoring

Monitoring is the systematic and routine collection of information from projects and programmes for four main purposes:

- To learn from experiences **to improve practices** and activities in the future;
- To have **internal and external accountability** of the resources used and the results obtained;
- To take **informed decisions** on the future of the initiative;
- To promote **empowerment of beneficiaries** of the initiative.

Evaluation

- Evaluation is a**ssessing, as systematically and objectively as possible**, a completed project or programme (or a phase of an ongoing project or programme that has been completed).
- Evaluations **appraise data and information** that inform strategic decisions, thus improving the project or programme in the future.
- Evaluations should help to draw conclusions about five main aspects of the intervention:

Relevance; effectiveness; efficiency; impact; sustainability

The 4 Keys to Successful Grant Management

- Compliance e.g on eligibility – LMICs....
- Best Practices (accounting internal controls; procurement system controls; records retention policy; IP management system; travel policy, MTA policies etc
- Roles and responsibilities
- Implementation to Close-out plans

REACTION(S) FROM THE PLENARY

Teamwork is critical to success of any project. It would be ideal if members/researchers embrace team work.

RESEARCH ETHICS AND INTEGRITY

By Philip O. Owuor, PhD, FAAS, FKNAS

Professor of Chemistry and Chairman,
Maseno University Ethical Review Committee
Department of Chemistry
Maseno University

BACKGROUND TO RESEARCH ETHICS

- Prior to 1906, there were no regulations regarding the ethical use of human subjects in research.
- There were no consumer regulations, no Food and Drug Administration (FDA), no Common Rule, and no Institutional Review Board (IRB).
- What follows is a brief discussion of why rules and regulations for conduction research were established and why the IRB became a necessity

Nazi Germany: Experimentations with Human Subjects

- Dr. Mengele's Experiments
  - **Infected one twin** with a "germ". When s/he died, the other twin was **killed** and their organs compared at autopsy.
  - **Sewed twins** together to create a Siamese twin.
  - Studied persons with **genetic traits** so as to better "**purify** the Aryan **super race**".
  - Performed **cross transfusions** to "make **boys into girls** and girls into boys".

Nuremberg Code

- On December 9, 1946, an American military tribunal opened criminal proceedings against 23 leading German physicians and administrators for their willing participation in war crimes and crimes against humanity.
- Among the charges: German physicians conducted medical experiments on thousands of concentration camp prisoners without their consent.
- Most of the subjects of the experiments died or were permanently crippled as a result.

Post War Response:

"The Case Against the Nazi Physicians"

- **Nuremberg Doctors' Trial – 1946 –47**
  - 23 defendants; 3 non-physicians
    - 16 found guilty
    - 7 were hanged
    - 5 sentenced to life in prison
    - 4 sentenced to 10-20 years in prison
    - 7 were acquitted and freed.

Trial Outcome

- The Nuremberg Code was established in 1948, stating that "The voluntary consent of the human subject is absolutely essential,“
- The Code made it clear that subjects should give consent and that the benefits of research must outweigh the risks.
- Although it did not carry the force of law, the Nuremberg Code was the first international document which advocated voluntary participation and informed consent.

Thalidomide

- Thalidomide was approved in the late 1950s, as a sedative in Europe;
- The drug was prescribed to control sleep and nausea throughout pregnancy,
- It was soon found that taking this drug during pregnancy caused severe deformities in the fetus.
- Many patients did not know they were taking a drug that was not approved for use by the FDA, nor did they give informed consent.
- Some 12,000 babies were born with severe deformities due to thalidomide.

Thalidomide Trials Outcome

- U.S. Senate hearings followed and in 1962 the so-called "Kefauver Amendments" to the Food, Drug and Cosmetic Act were passed into law.
- This was to ensure drug efficacy and greater drug safety.
- For the first time, drug manufacturers were required to prove to FDA the effectiveness of their products before marketing them.

Tuskegee Syphilis Study (1932-1972)

- U.S. Department of Health sponsored the Tuskegee Syphilis Study.
- Studied the effects of untreated syphilis in 400 African American men.
- Researchers withheld treatment even when penicillin became widely available from 1940.
- Researchers did not tell the subjects that they were in an experiment.

✓ Most subjects who attended the Tuskegee clinic thought they were getting treatment for "bad blood.“ What happened? •28 deaths:

- •100 cases of disability

(**President Clinton’s Public apology for tragedy 16.5.1997)**

Declaration of Helsinki

- In 1964, the World Medical Association established recommendations guiding medical doctors in biomedical research involving human subjects.
- The Declaration governs international research ethics and defines rules for "research combined with clinical care" and "non-therapeutic research."
- The Declaration of Helsinki was revised in 1975, 1983, 1989 and 1996 and is the basis for Good Clinical Practices used today.

Issues Addressed in the Declaration of Helsinki:

- Research with humans should be based on the results from laboratory and animal experimentation
- Research protocols should be reviewed by an independent committee prior to initiation
- Informed consent from research participants is necessary
- Research should be conducted by medically/scientifically qualified individuals
- Risks should not exceed benefits

National Research Act (1974)

- Due to the publicity from the Tuskegee Syphilis Study, the National Research Act of 1974 was passed.
- The Act created the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research,
- The Commission was "to identify the basic ethical principles that should underlie the conduct of biomedical and behavioral research involving human subjects and to develop guidelines to assure that such research is conducted in accordance with those principles."
- The Commission drafted the Belmont Report, a foundational document in for the ethics of human subjects research in the United States.

The Belmont Report

- The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research prepared the Belmont Report in 1979.
- The Belmont Report summarizes the basic ethical principles identified by the Commission in the course of its deliberations.
- The Report is a statement of basic ethical principles and guidelines to assist in resolving ethical problems surrounding the conduct of research with human subjects.
- The three basic ethical principles and their corresponding applications are: **Respect for persons, Beneficence, Justice**

Respect for persons

- Individuals should be treated as autonomous agents
- Persons with diminished autonomy are entitled to protection.

Application

Informed consent

- Subjects, to the degree that they are capable, must be given the opportunity to choose what shall or shall not happen to them
- The consent process must include three elements:
    - information,
    - comprehension, and
    - voluntariness.

Respect

- **Respect** for persons
    - Obtain **informed consent**
    - Participation is absolutely **voluntary**
    - Participants **free to withdraw**
    - **Privacy** to be respected
    - **Confidentiality** must be protected

Beneficence

- Human subjects should not be harmed
- Research should maximize possible benefits and minimize possible harms.

Application

Assessment of risks and benefits

- The nature and scope of risks and benefits must be assessed in a systematic manner
- **Maximize** expected **benefits** and **minimize** potential **harms**
- Ensure that **research design is adequate** to **derive benefits** from results

Justice

- The benefits and risks of research must be distributed fairly among all **social** and **economic** classes and **ethnic** and **racial** groups in society.
- *Application*

Selection of subjects

- There must be fair procedures and outcomes in the selection of research subjects

The Main Elements of the Common Rule Include :

- Requirements for assuring compliance by research institutions;
- Requirements for researchers obtaining and documenting informed consent;
- Requirements for Institutional Review Board (IRB) membership, function, operations, review of research, and record keeping.
- Additional protections for certain vulnerable research subjects-- pregnant women, prisoners, and children

NACOSTI and MUERC

- The National Council for Science, Technology and Innovation ("NACOSTI") is the **Kenyan** National **Ethics** Committee (NEC).
- There are also Local **Ethics** Committees (LECs). In Maseno University there is MUERC
- Any **research** involving human participants must obtain approval from an EC recognized by the NEC, i.e., an accredited-LEC, before a trial may commence

Roles of local ERC/IRB (MUERC)

Ensures that the research:

- Design and objectives are scientifically sound
- Question is relevant to the local environment
- Respectful of local cultures and practices
- Compliance with legislations and statutes
- Data monitoring and evaluation
- Conduct, training and competence of personnel
- Review of human volunteers, human tissues, identifiable human data

Roles of Statutory Bodies

- Inspection of research sites and audit of research conduct
- Safety monitoring
- Ordering for termination or investigation for misconduct
- Receiving complaints about misconduct
- Recommending criminal prosecution
- Periodic surveillance of adherence/ misconduct

Purpose of the proposal

- ✓ First and most important stage of documenting any research study
- ✓ Blue print for intended research
- ✓ Funding requirements
- ✓ **University degree- dissertation/thesis**
- ✓ Academic research

Components of a Research Proposal

- For Graduate Students this is covered by SGS

Ethical consideration

- ✓ Who will give the ethical approval?
- ✓ Who will give the research permit?
- ✓ Written consent
- ✓ Participant information sheet
- ✓ Consent form
- ✓ Risks and benefits
- ✓ Incentives
- ✓ Signatures
- ✓ Information on who to contact

Appendices

- **Curriculum vitae of PIs**
- Study instruments/questionnaires
- **Information sheet and consent form**
- Brochures to be distributed
- Special procedures
- Quality assurance procedures
- Others

The Role of MUERC

1. **Review** and **clear** proposed research before its commencement.
2. Provide **INDEPENDENT**, competent, and timely review of the ethics of proposed studies.
3. Review the adequacy of the informed consent document, particularly as to its description of the **risks** and **benefits**.
4. Review **prospective** and **continuing** research protocols
5. Evaluate reports for unanticipated **problems**, possible **non-compliance**.
6. **Act in the interest** of potential research participants and concerned communities.

Compliance with the MUERC Operational Guidelines

Ensures that

- ✓ The **dignity, rights, safety** and **well-being** of research participants are promoted
- ✓ The results of investigations are **CREDIBLE.**

Approval of Proposed Study by an ERC is mandatory if You Wish:

- o **publish** research results in a credible journal,
- To obtain a research **permit** from the National Commission for Science, Technology and Innovation (NACOSTI)

Submitting an Application

- The MUERC secretariat receives research proposals for ethical review from applicants through the **Research Directorate** in the manner and format prescribed.
- Application forms can be downloaded from the Maseno University website **www.mu.ac.ke**

Review

- All properly submitted applications are reviewed in accordance with the protocol established by MUERC.
- Graduate students proposals must be approved by School of Graduate Studies
- The MUERC meets once every month scheduled in the University website.

REACTION(S) FROM THE PLENARY

The Ethics committee reviews research which deals with human subjects.

Most universities have embraced the use of anti-plagiarism software to alleviate challenges of research dishonesty.
A researcher can be cleared to undertake research by any accredited University's Ethics Review Committee provided it is registered by NACOSTI.

ENGAGING POSTGRADUATE STUDENTS IN RESEARCH FOR IMPACT

By Dr. Patrick Onyango

Maseno University

Research impact?

- "an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life beyond academia"
- "translating research into real-world outcomes, benefitting the health, prosperity and well-being of people and society"

Why care about research impact?

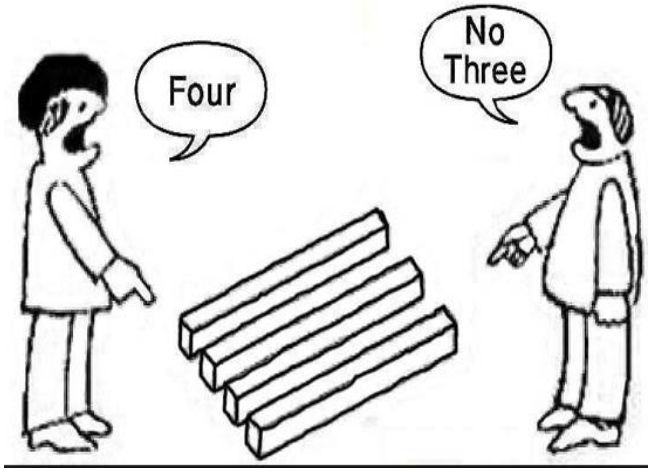
- **Because** "society grants science and scientists freedom to research in the fields established by their curiosity….. Additionally, society grants us financial and human resources to carry out these investigations and gives us a certain degree of recognition.
- **What do we give in exchange?"**
  - Prof. Jorge E. Allende
    Programa de Biología Celular y Molecular

ICBM, Facultad de Medicina, Universidad de Chile

Building blocks for research impact

- A more interesting question is **How do we give in exchange?**
- In part the answer to that question is rooted in what constitutes research impact.
- **Relevance**: Applicability of research findings.
  - Given the varied and diffuse nature of application, it is argued that relevance is a subjective construct.
- **Rigor**: Following prescribed procedures for conducting research.
  - Rigor is therefore guided by established norms.
- **Responsibility:** This component of research, albeit mostly ignored and viewed by most as a bottleneck, is fundamental in the pursuit of both rigor and relevance.
- It deals with ethical issues that guide the conduct of research.

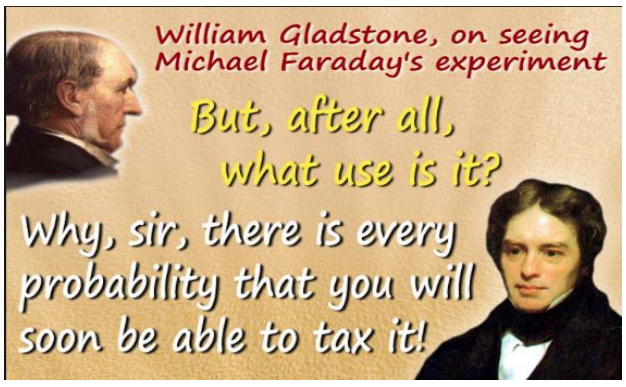
Rigor vs. relevance



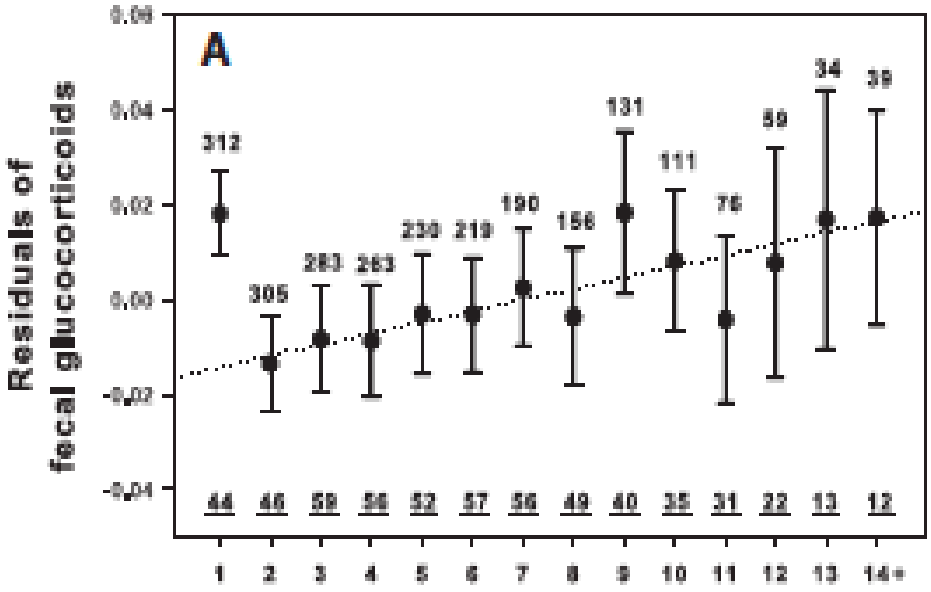
- Case can be made that rigor begets relevance and thus research impact.
- The converse holds in a few cases for the simple reason that relevance is outside the researcher thus subject to divergent interpretations.

Basic vs Applied Research

- The debate on rigor vs relevance is often presented as that between basic and applied sciences.
- Prof. Richard Schrock who won the Nobel Prize in 2005, says: "I got here by doing basic research." By following his curiosity, he says, he developed the catalysts for the chemical reaction now used every day for the green production of pharmaceuticals, fuels, and other synthetic chemicals.
- "The value of basic research is you discover something you didn't expect — that nobody expected. And it's where almost everything we now expect came from," he says. My work had applications. I just didn't know it at the time."



A personal example (From Baboon research)



Life at the Top: Rank and Stress in Wild Male Baboons

Laurence R. Gesquiere,[1]* Niki H. Learn,[1] M. Carolina M. Simao,[1] Patrick O. Onyango,[1] Susan C. Alberts,[2,3] Jeanne Altmann[1,3,4]

In social hierarchies, dominant individuals experience reproductive and health benefits, but the costs of social dominance remain a topic of debate. Prevailing hypotheses predict that higher-ranking males experience higher testosterone and glucocorticoid (stress hormone) levels than lower-ranking males when hierarchies are unstable but not otherwise. In this long-term stuc

A personal example: Media coverage

Being top baboon can be very stressful

By Amina Khan, Los Angeles Times

JULY 15, 2011

Think it's easy at the top? Turns out chasing females, putting down underlings and generally maintaining one's social status can be very stressful.

If you're a baboon, that is. A nine-year study tracking five troops in Kenya found that the top-ranked alpha males had more stress than the second-place beta males. In fact, the top dog – er, baboon – was just as on-edge as those unfortunate primates at the bottom of the totem pole.

Sympathy for the CEO

Robert M. Sapolsky
+ See all authors and affiliations

Science 15 Jul 2011:
Vol. 333, Issue 6040, pp. 293-294
DOI: 10.1126/science.1209620

Article | Figures & Data | Info & Metrics | eLetters | PDF

Figures

Life at the top.

In the male baboon's world of intense rank competition, being at the top of the hierarchy may have some drawbacks along with benefits. Shown are two fighting adult male baboons in the wild in Amboseli, Kenya.

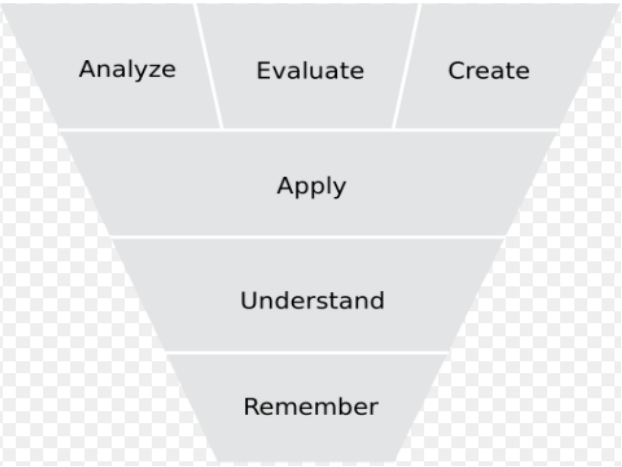
CREDIT: JEANNE ALTMANN

Why do you think our paper got such publicity?

Engaging students in RI

- **Multi-stakeholder engagement:**
- **Coursework**
    - **That encourages appreciation of the scientific process**
    - **Challenging student's intellectual growth**

Using Bloom's taxonomy in teaching and evaluation



- **Researcher/Scientist**
    - Keeping our eyes peeled for societal problems in our environment because although some problems must be communicated by practitioners, others are in the public domain.
    - Paying attention to national and international research and development (R & D) agenda
        - Vision 2030
        - Science, Technology, and Innovations Strategy for Africa 2024
        - SDGs, among others.

- **Supervisors**
  - Focus research as opposed to each student walking through the door with their own research question.
  - Appreciate scope of their expertise and implications on research rigor
  - Appreciate their responsibility as stewards of research and scholarship.
- **Learning institutions**
  - Foster a collegial environment for both knowledge quest and exchange.
  - Review their bottom line in student recruitment
  - Policy on research conduct.
  - Incentives to encourage research deliverables such as publications and patents.
  - Establish linkages with other research institutions and practitioner communities.
- **Government**
- Establish and support a national R&D agenda
  - Research funding opportunities
  - Incentives for outstanding researchers
  - Enabling environment
    - National Research Fund
    - National Commission for Science, Technology and Innovation
- Encourages collaborations across learning and research institutions and practitioner communities especially declining public finances for research.
- **Practitioner community**
  - Recognize that some of the problems it faces may not be obvious to researchers in academic institutions.
  - Establish linkages with academic institutions and other research organizations.

In conclusion

Research inspired by:		CONSIDERATIONS OF USE	
		No	*Yes*
QUEST FOR FUNDAMENTAL UNDERSTANDING	*Yes*	Pure Basic Research (Bohr)	Use-Inspired Basic Research (Pasteur)
	No		Pure Applied Research (Edison)

Stokes' (1997) quadrant model of scientific research.

REACTION(S) FROM THE PLENARY

Postgraduate research is undertaken in order to improve students' capacity in matters of research. There is need to provide incentives to supervisors and students who excel in research and innovation

SCHOLARLY WRITING AND PUBLICATION IN PEER REVIEWED JOURNALS

By Benson Ojwang, Ph.D.,

Senior Lecturer,
Linguistics Department
Maseno University.

OBJECTIVES

- WHY publish ?
- WHO is to publish ?
- WHAT to publish ?
- WHEN to publish ?
- WHERE to publish ?
- HOW to publish ?

WHY PUBLISH?

- A professional obligation to the community of scholars/scientists cf medical discovery – the Kemron controversy
- To expose findings /disseminate knowledge
- Seek feedback/peer review
- Stamp your authority / break new ground
- Ignite debate /motivate new scholars
- Stimulate continuous research-current findings are just tentative
- Institutional requirement for submission/graduation

WHO IS TO PUBLISH?

- Individual career scholars in universities
- Research project teams/consortia
- Postgraduate students Master/Ph.D, post-doc
- Specialists in research institutions e.g. KEMRI, KEFRI, KALRO
- Government departments

- Local, national and international NGOs
- International organizations e.g. UN bodies
- Specialist /members only professional bodies and societies e.g. KCS, KNAS, NNAK, ICPAK

WHAT TO PUBLISH?

- Full length research articles
- Short commentaries /feedback on articles
- Book reviews
- Conference papers
- Theses and dissertations as monographs
- Lecture series /modules
- Chapters in books
- Handbooks
- Full textbooks

CHARACTERISTICS OF SCHOLARLY WRITING

- Has scientific value - empirical
- Demonstrable originality
- Clarity of variables, methods, results
- Relevance and Timeliness
- Readability (cohesion and coherence)
- Objectivity, reliability and validity of content
- Logical presentation and format
- Completeness (no information gaps)
- Intellectual input / knowledge creation

PUBLICATION BEST PRACTICES

- Peer review / evaluation /refereeing
- Criticism up to perfection
- Universal appeal in form and content
- Standardized language use
- Academic discourse, tone and expression
- Usability /availability / accessibility
- Data oriented analytical approach/evidence-based
- Author flexibility /willingness to change
- International/ interdisciplinary benchmarking

WHERE TO PUBLISH

- International refereed journals: two types

  1. Traditional journals (subscription only)

     Free to author/reader pays

  2. Open access journals 'the elephant in the room'

     Free to reader / author pays

- Conference proceedings
- Contributed volumes
- Monographs
- Textbooks
- Reference works, handbooks, encyclopedias

CHOOSING THE RIGHT JOURNAL

- Capacity (Elsevier, Springer, Wiley, Routledge)
- Relevance/scope /specialization
- Frequency (quarterly, annually, biannually)
- Reputation : Aim high e.g. (*Nature, Acta* series)
- Accessibility
- Submission process / user friendly platforms e.g. Manuscriptcentral
- Turnaround time
- Impact Factor / citation index cf 'Researchgate' and other databases/online repositories
- Calibre of editorial board , host institution= credibility

QUALITY CONTROL IN REFEREED JOURNALS

- Initial in-house screening by editor in charge - for overall suitability of content and format/ conformity with all submission requirements
- Anti-plagiarism check – e.g. turn-it-in
- The peer review process – rigorous BUT who is a peer?

  Open review (two-way transparent)

  Single-blind review (one-way transparent)

  Double-blind review (two-way opaque)

HOW TO PUBLISH

- Academic writing is a habit
- The process (inputs) determine the quality of the product of writing
- Understand the standard practice in your area of specialization
- Collect data: read, compare, synthesize, experiment , generate fresh research ideas
- Brainstorm and prepare an outline
- Follow standard/existing formats

- Write a draft, compose, revise then edit and proofread
- Consult local peers/supervisors before submission

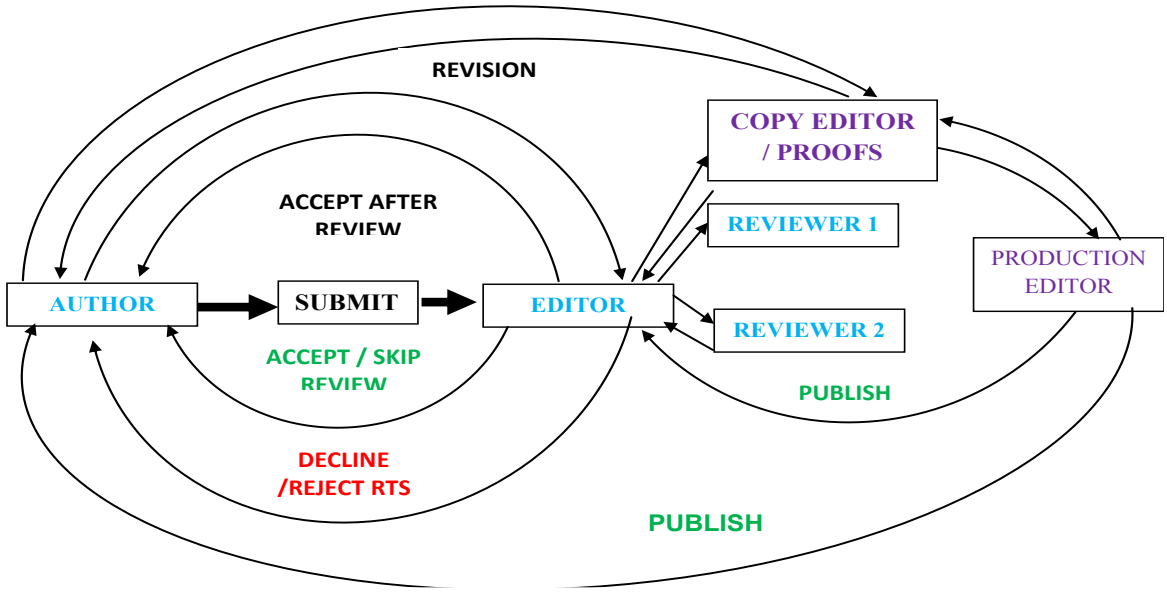
FASHIONING THE ABSTRACT

- The abstract is the window to your article/paper (Context-Relevance -Objectives Process-Scope)
- Demonstrates the potential and promise of the content
- Concise and adequate, not verbose
- No circumlocution, succinct, explicit
- Coherent and cohesive
- Reflective of output, overall design & significance
- Identify a knowledge gap framed as a theme /sub-themes (your unique selling point) and focus on developing them systematically
- Contextualize your article/topic theoretically, historically, geographically, socially e.t.c
- Support arguments with data/exemplification-provide scientific proof
- Choose a theoretical/conceptual framework to ground the article and restrain your reasoning
- Review literature : global-regional-local
- Leverage on previous findings to find a point of departure
- Identify preference and priority areas of journals
- Regular vs thematic/special issues
- Familiarize yourself with the submission requirements
- Collaborate with the editor-in-charge
- Be prompt with revisions and take criticisms in your stride
- Respond to reviewers' comments objectively but not too defensively
- Respect deadlines and do not procrastinate

THE PITFALLS TO AVOID:

- Plagiarism and other unethical practices
- Copyright infringement
- Duplication / replication
- Generalizations (sweeping statements)
- Contradictions and circularity
- Assumptions
- Unproven allegations / claims
- Spurious arguments
- Far-fetched conclusions /impractical recommendations

THE PUBLICATION CYCLE



REACTION(S) FROM THE PLENARY

The Kenyan Universities should launch reputable research journals which can compete favourably globally.

INNOVATIONS AND COMMERCIALIZATION OF RESEARCH OUTPUTS BY UNIVERSITIES FOR DEVELOPMENT

By Dr. John Ayisi (State Department for University Education and Research –MOE)

Acknowledgements

- Maseno University – for invitation to attend conference and share my experiences
- Constitution of Kenya - Article 33 (1) (c) on freedom of expression acknowledges academic freedom and freedom of scientific research
- Disclaimer: Views expressed here are mine and do not imply endorsement by the Kenyan Ministry of Education

Presentation Overview

Knowledge based economy

Role of University

'*Triple Helix*' Model

Legal Frameworks

Some observations/Kenyan situation

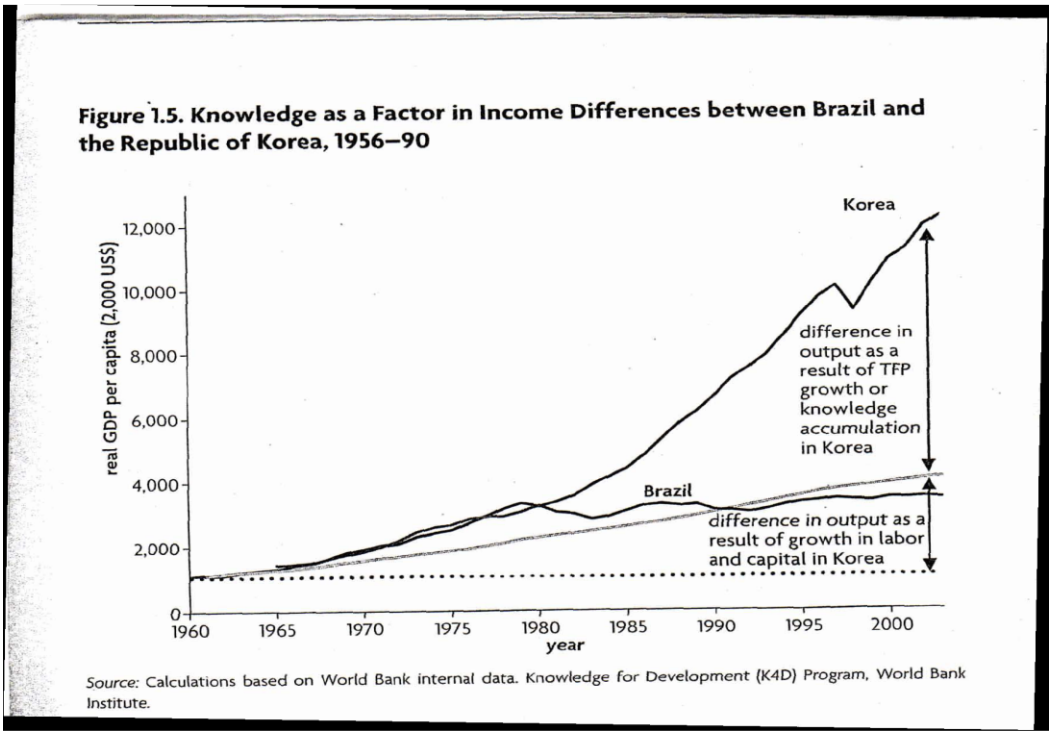
Kenyan university success stories

Discussions

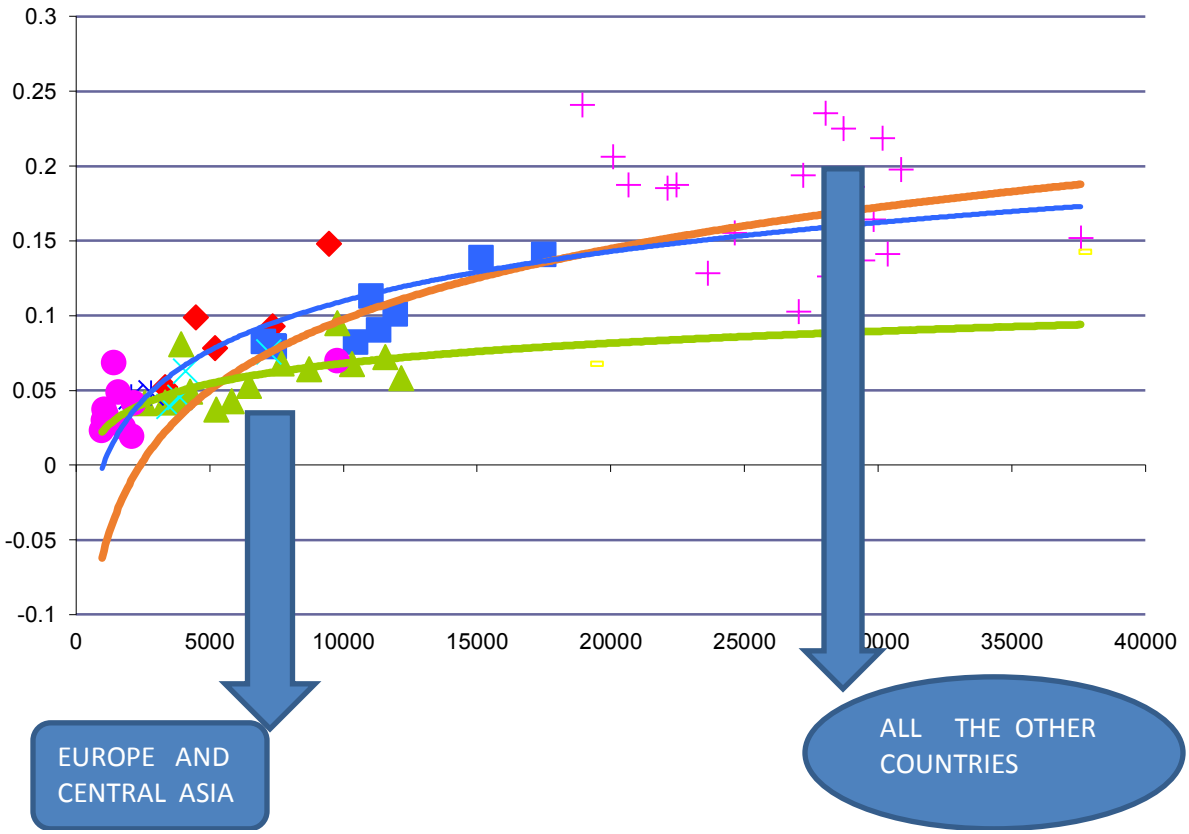
Way Forward

ST&I and Economic Development

- **Robert Solow (1957)** using economic theory and mathematical analysis to data in USA from 1909-1949:
  - Demonstrated that **7/8 of growth in GDP** was attributed to **technological** development
  - re-analyzed same data later and showed that GDP growth was explained by **30% education** and **64% technology**
  - **In 1987, he was awarded Nobel prize for this finding**
  - **investments in research thus benefit society** (Jones and Williams, 1998)



Innovation Increases people's Income



Knowledge-based economy

- **Based on Vision 2030,** Kenya is to transit from **"factor driven"** model of economic development to one that is knowledge-based and ***"innovation driven"***

➢ **Effective ST&I policies:**

- *high investment in education and training at ALL levels* ***(creative/critical thinking i.e., Centres of Excellence)***
- ***high-quality*** *scientific research institutions*
- *extensive relationships between governments, academia, and industry* ***(Triple-Helix),*** *and;*
- *protection of the* ***intellectual property***
- ***Nationhood*** (invoke **article 10(2) (Chapter Two)** on *national values and principles of governance*, **article 73 of (Chapter Six)** on *leadership and integrity* and **article 232 (Chapter Thirteen)** on *values and principles of public service* in educational curriculum at all levels of the education system)

✓ Key factors of **strong economies and robust societies** in the **21st century**

(Lowe, 2005; World Economic Forum, 2010/2011)

Role/Functions of a University

Universities hold **three** core, overlapping and integrated functions:*****

- provide highest standard/quality **teaching**,
- engage in scholarly quality scientific **research and innovation,** and;
- undertake a **'third stream' role** of dissemination of outputs of research to **'community/industry engagement/outreach' or 'knowledge/technology transfer' – commercialization (ideas to products/services)**

*****(University Act, 2012)

University-Industry Linkages

- Because of **commercialization role (still new)**, Universities have more potential to contribute to R&D – **knowledge-based economy**
- the topic of university-industry linkages **(commercialization)** is increasingly coming to the fore in higher education policy dialogue in Africa*
- many governments establishing universities and taking action to foster university-industry linkages
- Kenyan Universities have increased from **1** in 1983 to >**70** in 2019 (www.cue.or.ke)
- **Huge investment** in higher education underlines importance of trained manpower in national development

---

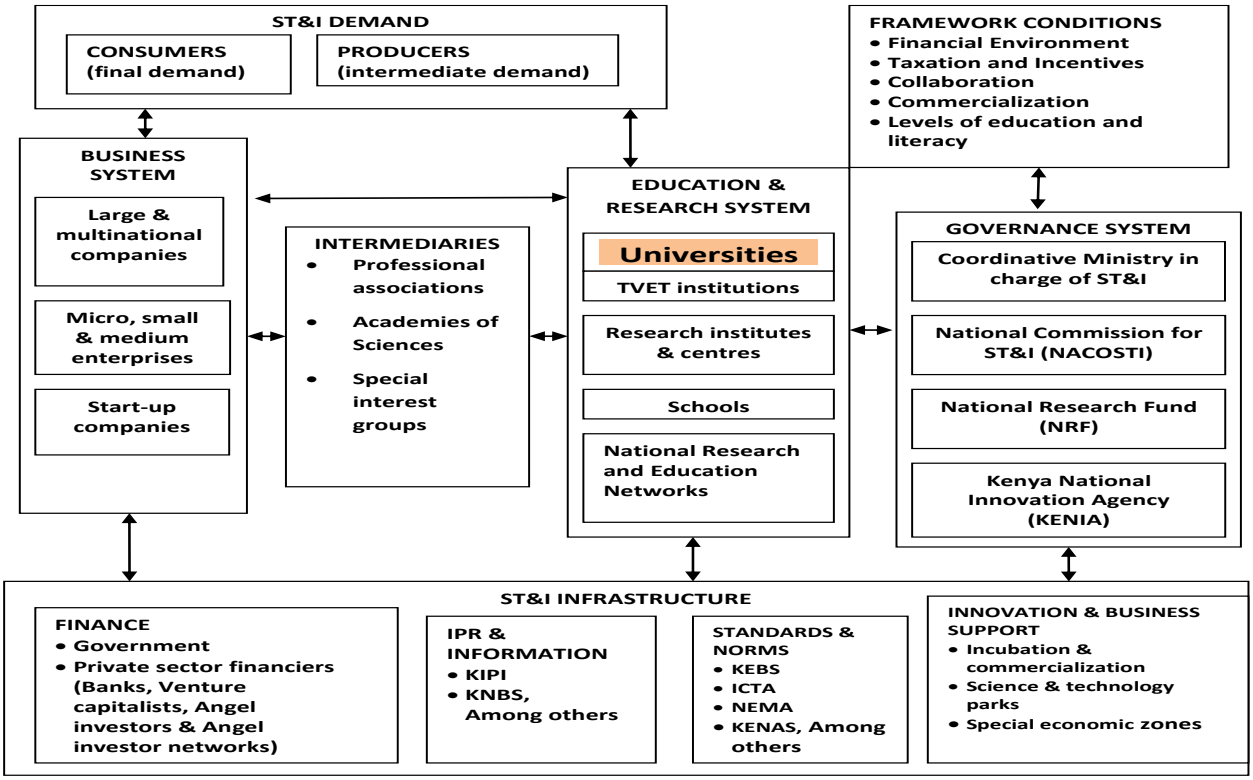
*(African Higher Education Summit, Dakar, Senegal, March, 2013)

University and Knowledge-based economy

- In knowledge economy - **(**It's the **educated people and their ideas)** are key resource
- the creation, dissemination and application of knowledge – a factor of strong economies and robust societies in the **21st century**
- research and development (R&D) is key to economic growth and global competitiveness
- the universities, as **major centres of learning and research** – becoming important as the sources of ideas, knowledge, skills, innovation and technological advances – **Universities at Centre of National Innovation Systems**

(Rooney *et al*., 2005; Khademi *et al*., 2015)

Proposed Kenya's National Innovation System



(Draft, ST&I Policy, 2008)

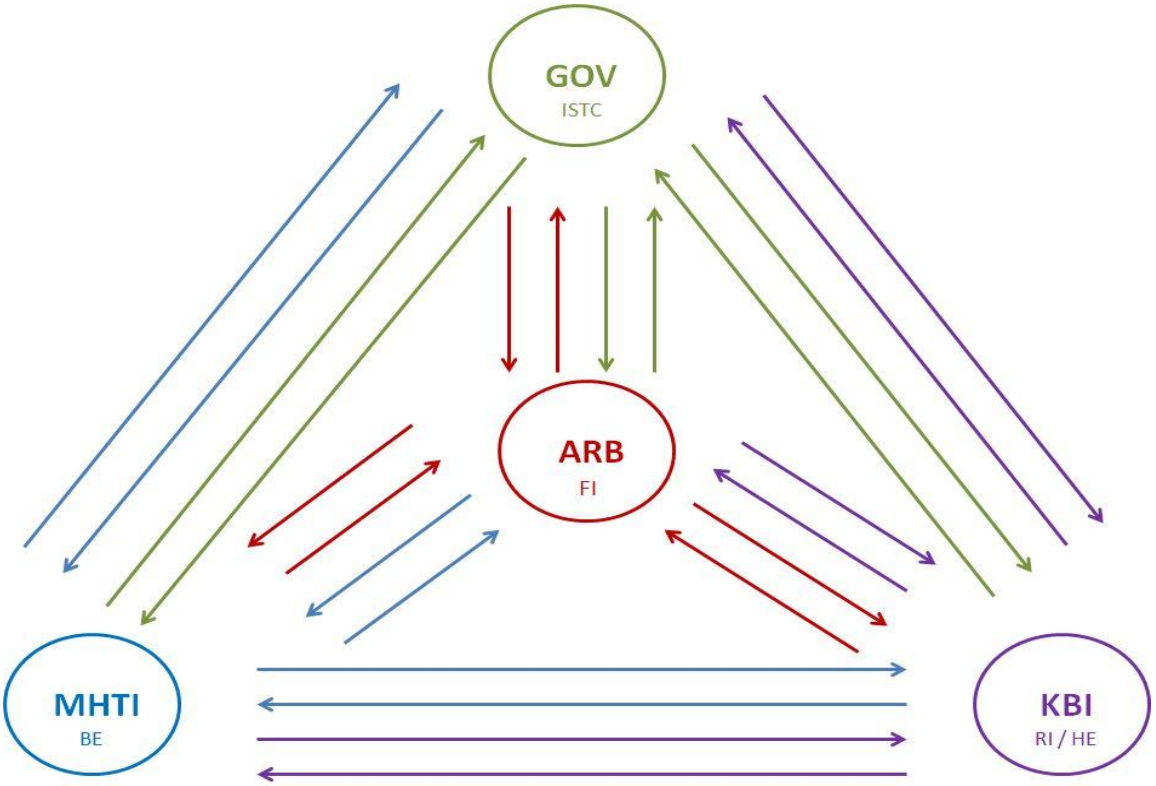
What an Effective NIS does

- **strengthening networks between:**
  - higher education, technological institutions, academic entrepreneurs, and local industries in support of **R&D projects and technology transfer**,
  - the provision of **risk capital** for new innovative companies and micro-financing for start-ups,
  - **seed coaching and stipends** for academic entrepreneurs

Triple Helix model

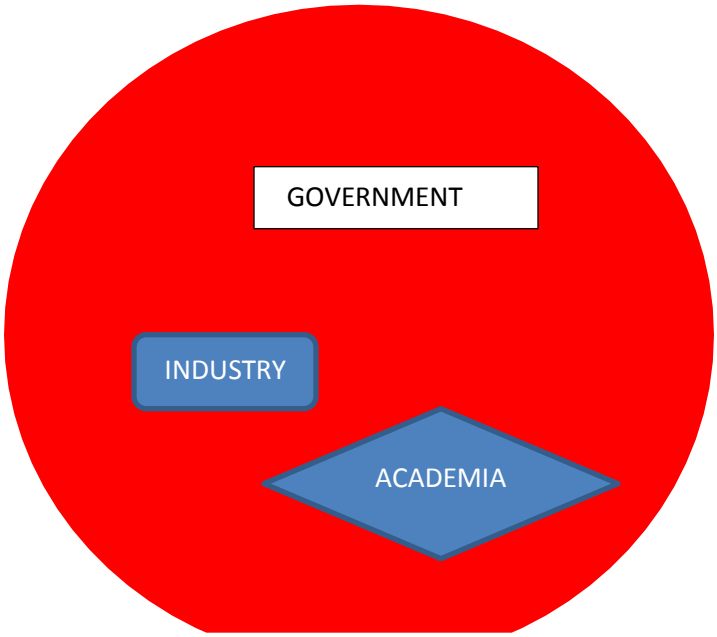
- Studies show universities with closer ties to industry – are more entrepreneurial
- Three key players in NIS are **industry, government, and universities** in a '***triple helix***' who need to be brought together and be collectively **energized**
- recently, **there is the inclusion of civic society** to the triple helix, leading to a '***Quadruple***' **model**
- addition to producing **work-ready** graduates, **synergies** between universities and industry **promotes innovation and technology transfer** – *commercialization*

Etzkowtitz and Leydesdorff, (1997); Carayannis and Campbell (2012)



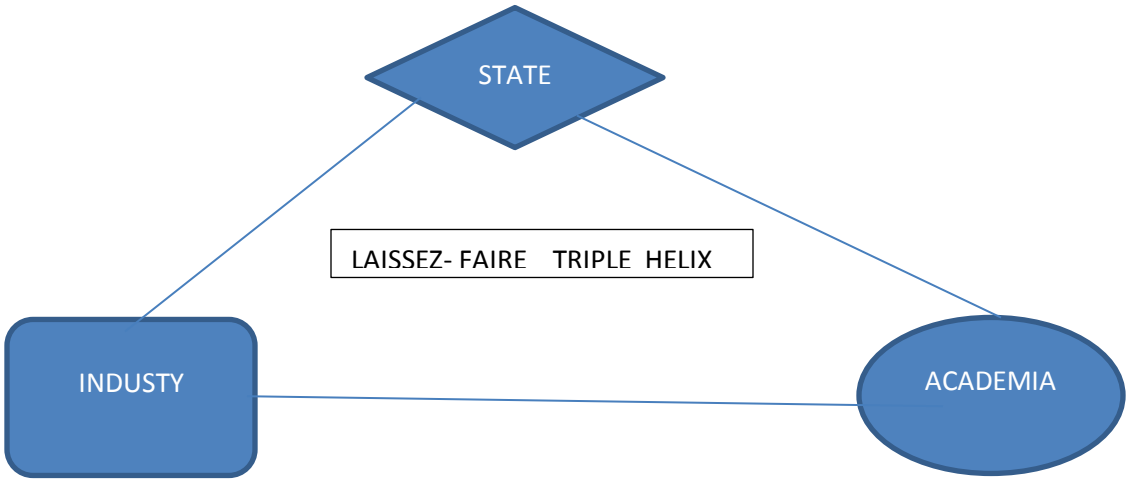
Etzkowtitz and Leydesdorff, (1997)

Statist Triple Helix



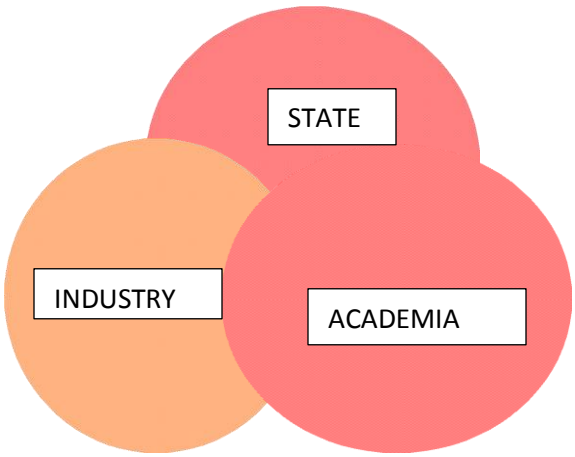
Statist Configuration:

- Government plays the lead role
- Drives university and industry, but
- Curtails their ability to undertake transformative and innovative transformations;
- Civil society is often actively suppressed



Laissez -faire configuration

- Industry plays the lead role;
- Limited state intervention;
- Government and university plays support roles
    - University: skilled human capital
    - Government: regulator of social and economic mechanisms
- Civil society is relatively inactive



Balanced Configuration: Civil Society is the Foundation Stone of the Triple Helix

Balanced configuration:

- Government, industry and university act in partnership;
- Each can take the lead role: substitution/complementary modes of interaction;
- Innovation takes place at the intersections of the 3 spheres
- Civil society is actively involved and constitutes the backbone of the system

Legal environment for Commercialization

- *commercialization* require not only increased investment in R&D, but also in the **legal frameworks, skills** and **infrastructure**
- In 1960s and 1970s, due to lack of clear policy on technology transfer, commercialization involved long periods – frustrations
- Congress to enact the **Bayh-Dole Act of 1980**
- universities were given the obligation to commercialize innovations resulting from public funding
- United States has **become very advanced** in technology transfer and commercialization of research due to this Act

---

(Mowery *et al*., 2004)

- Many OECD enacted similar legislation to Bayh-Dole Act, with universities being given the responsibility for managing and exploiting **IP**
- This gave universities the **'Third Stream' role**, in addition to **teaching** and **research**
- This also gave universities the ability to contribute to the commercialization of innovation

(Molas-Gallart *et al*., 2002; Mowery and Sampat, 2005)

Kenyan Situation

- commercialization of university research outputs (still new) requires appropriate policies and management systems
- If knowledge transfer can't be measured, it also can't be readily recognized and rewarded (Osborne and Gaebler, 1992)

Some Observations

- A study in 17 universities (15 Public and 2 Private)
- 6 universities did not respond (3 public and 3 Private)

University Commercialization Environment

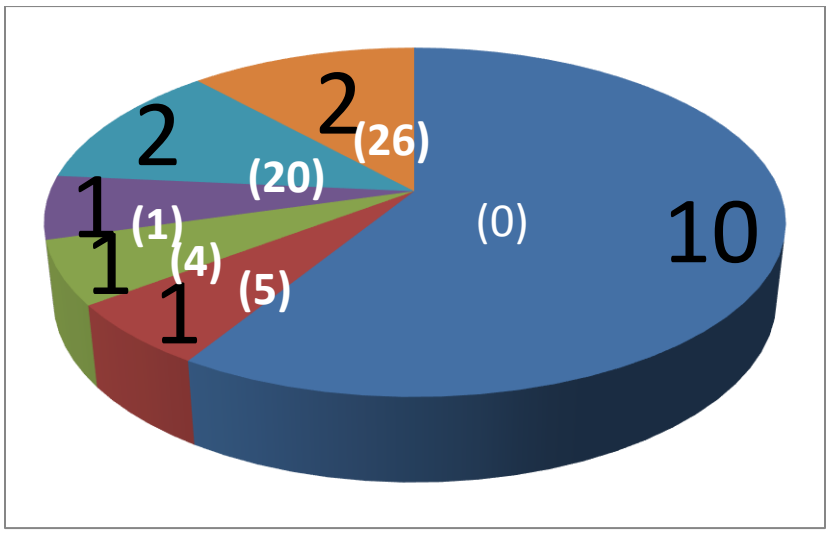
Study Variable	Number of respondents (N=17)
Geometric Mean Expenditure in KES on R&D (Range)	**21.1 (2M-3.5B)**
Median (IQR) Expenditure in KES on R&D	18.3 (9.5-33.0)M
Commercialization in University Vision and Mission Statements	16
Research in strategic plan	17
Commercialization in Strategic plan	17
University has guidelines on Commercialization	13
University has innovation policy	14
University informs industry on their products	11
University has financial target on commercialization	10

Variable	% respondents	No. of respondents (n=17)
University has a dedicated entity for commercialization		6
Number of spin-off companies started since university started or last 10 years		
● 0		12
● 1		3
● 2		1
● 3		1

Variable	% respondents	No. of respondents (n=17)
patents that universities have sought in last 5 years/since establishment		
● 0		9
● 2		2
● 4		2
● 8		1
● 13		2
● 20		1
Number of patents issued locally		38/47
Number issued elsewhere		1/47

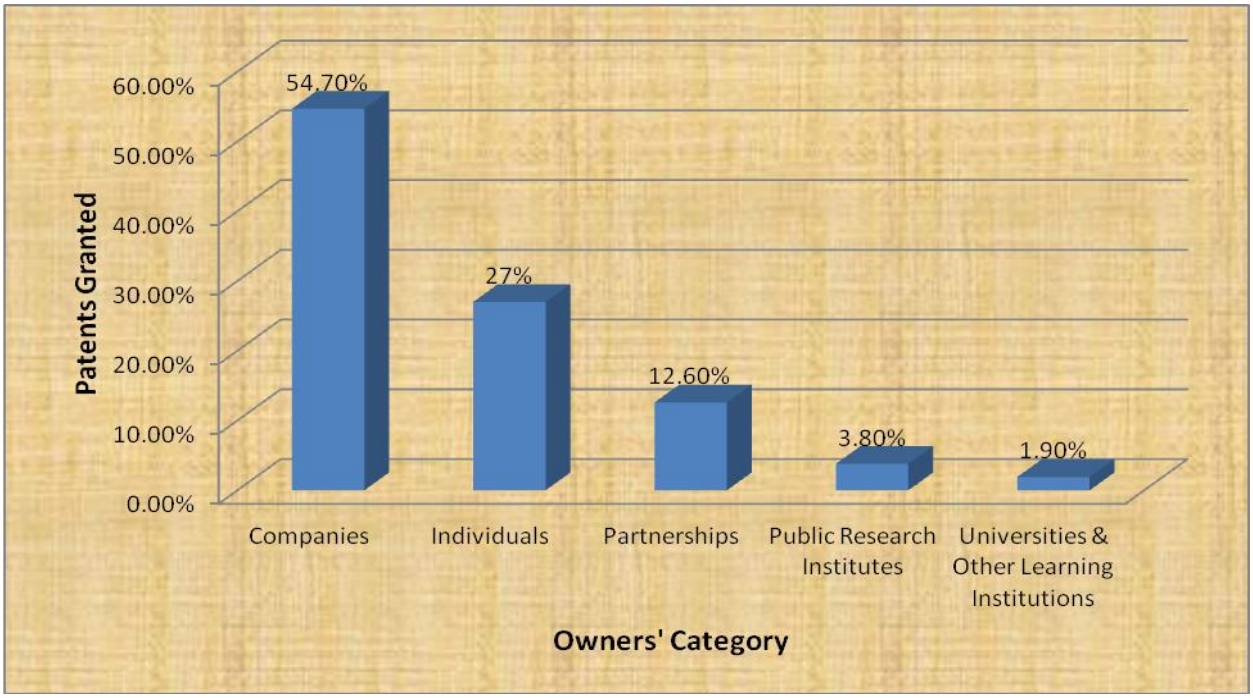
Intellectual Property Rights (IPR

No of Universities and their **Consultancies** in the last Two Years (n=17)



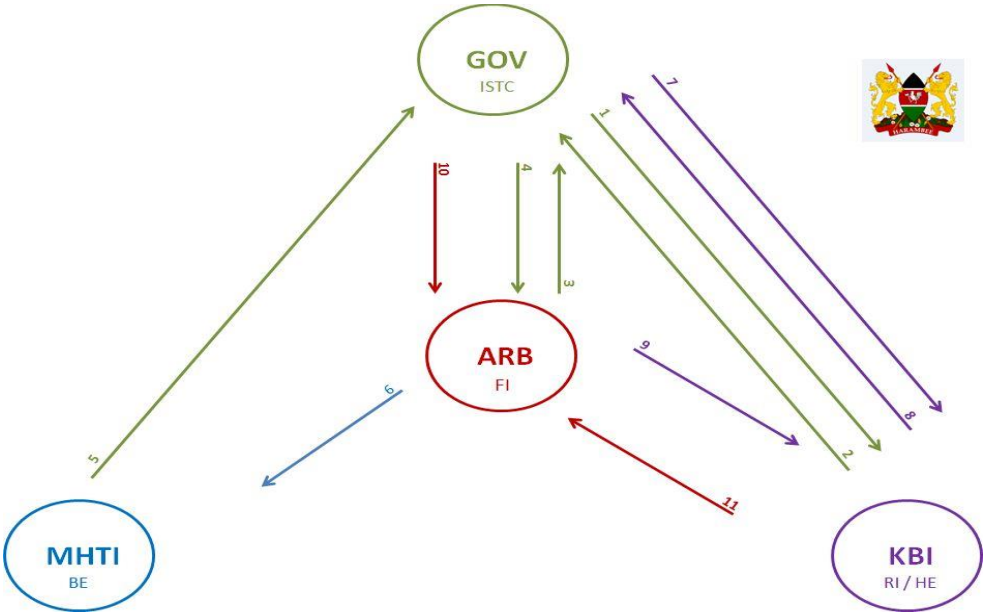
(Parenthesis = number of Consultancies)

NATIONAL PATENTS GRANTED (1990 – 2013)



(Bolo *et al*., 2015)

Kenyan University-Industry Linkages

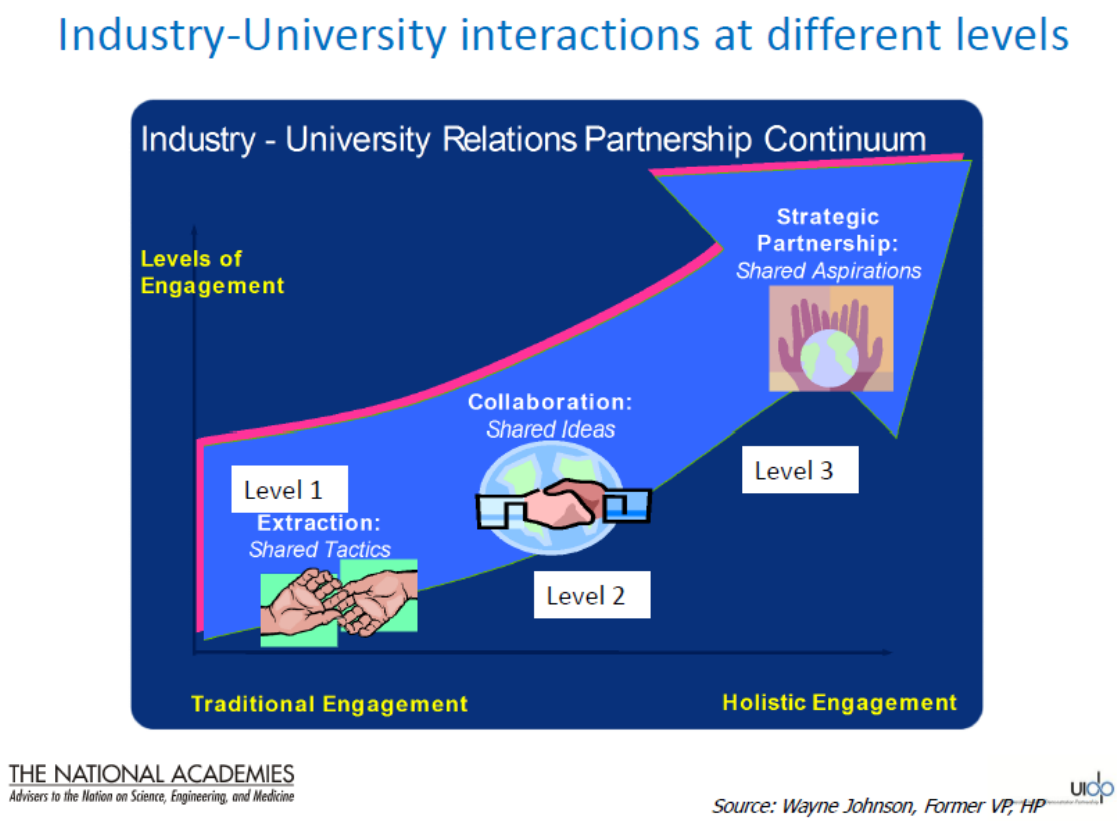


UNIDO, 2014

Characteristics of Generation of Universities (*Wissema, 2009*)

	1st generation	2nd generation	3rd generation
Objective	Education	Education + Research	**Education + Research + know-how exploitation**
Role	Defending the truth	Discovering nature	**Creating value**
Method	Scholastic	Modern Science, mono-disciplinary	**Modern Science, inter-disciplinary**
Creating	Professionals	Professionals + scientists	**Professionals + scientists + entrepreneurs**
Orientation	Universal	National	**Global**
Language	Latin	National languages	**English**
Organization	Faculties, Colleges	Faculties	**University institutes**
Management	Chancellor	Part-time academics	**Professional management**

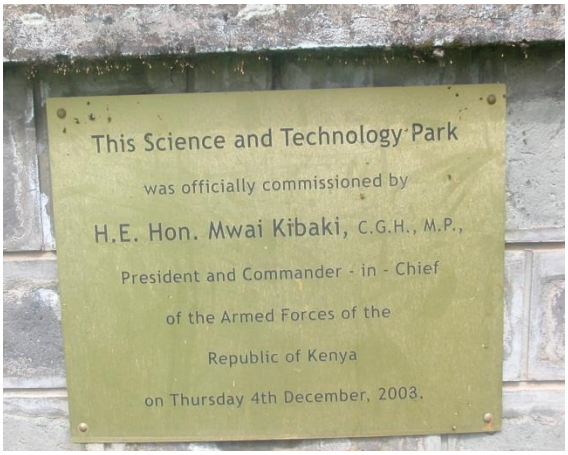
Partnerships, not collaboration



Establishment of Science and Technology Parks, or Business Innovation and Incubation Centres in Universities

Technology transfer from research labs in to markets

- Company incubation
- Linking innovators with investors


This Science and Technology Park
was officially commissioned by
H.E. Hon. Mwai Kibaki, C.G.H., M.P.,
President and Commander - in - Chief
of the Armed Forces of the
Republic of Kenya
on Thursday 4th December, 2008.


Technology For Development
SCIENCE & TECHNOLOGY PARK &
INDUSTRIAL LINKAGES (STPIL)
MELIPONI CULTURE PROJECT
TITLE: HARNESSING STINGLESS BEE FOR
POVERTY REDUCTION, WEALTH
CREATION AND CONSERVATION OF
BIODIVERSITY & ENVIRONMENT
FUNDING: MMUST - URF


Melibrandi
Melinasa
Meliwere

Addressing Energy Demands

Production of Biodiesel From Waste Cooking Vegetable Oil –

Dr. Betty Mbatia (Technical University of Kenya)

Biodiesel is being produced from Waste cooking oil collected from hotels and chips restaurants.

Waste oil & fat from hotels and restaurants

A TUK-TUK engine running on 100% Biodiesel

Development of Bio-fertilizer – Dr. Joseph Mwafaida, Pwani University

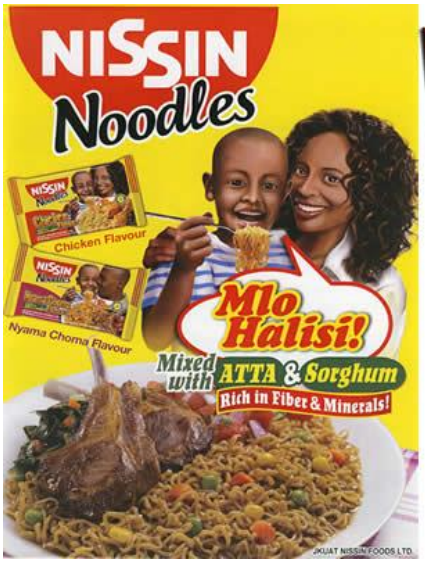
- Production Bio-fertilizer - Composted garbage after 4 months
- Price: Kshs 500
- Approx 55 bags per compost pit (3 X 4m)
- 5 bags per cubic meter (M^3) of raw garbage

Slays Innovate (KU)

Salsy Innovate ltd is a technology firm providing payment systems mainly to schools, colleges and universities.

Have partnered with a number of strategic partners including banks and retail outlets to ensure quality and innovative products for our customers.

<u>Example</u> : Jomo Kenyatta University of Agriculture & Technology: - Partnership with Nissin Foods Holdings Co., Ltd to foster food security technology in Kenya



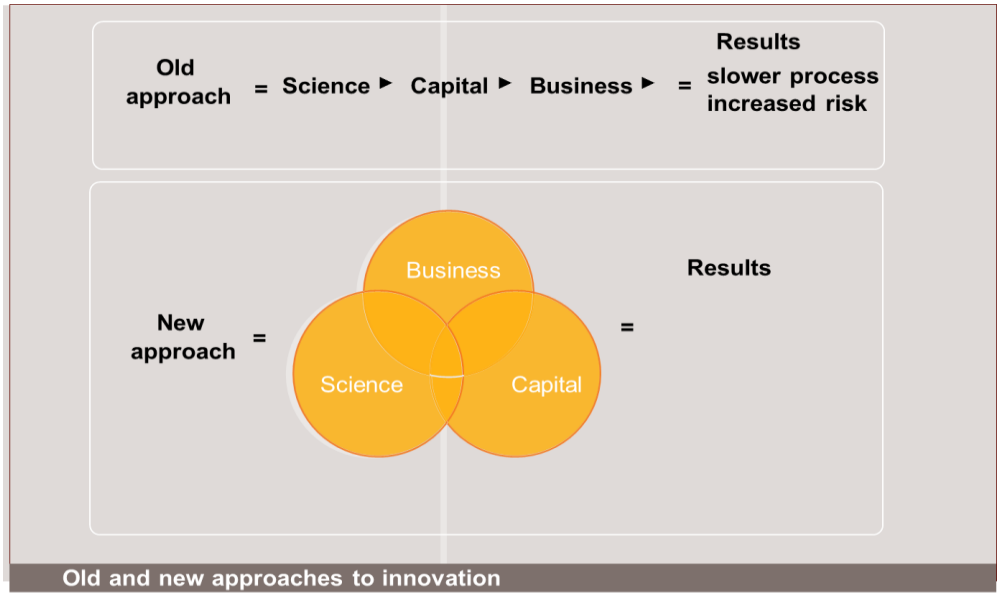
Noodles and Instant Porridge

Some funded projects with Success stories

Improve Maize Variety Resistant to Striga weeds - Prof. Mathew Dida (Maseno University)

Striga weed causes severe yield losses, sometimes the farmers loose 100% of their harvest. The agricultural sector suffers close to 7 billion USD in losses as a result of this infestation of the weed. The project developed a seed variety that withstands striga weed infestation.

Models Commercialization



Economic impact of commercialization to community

- Employment to community
- Consumptions of products of community
- Technology increasing community productivity
- Multiplier effect creating demand for other products/services
- Suppliers to university
- Spending in community by faculty
- Fees paid by students
- Enhanced quality of life.

Discussion/Conclusions

- Because of **small markets and low purchasing** power in Africa, **global firms** are unlikely to develop specialized products for Africa
- **universities are well-placed** to fill this role of increasing productivity, quality control and value addition, particularly SMEs
- Innovation to **transform** of Africa from a continent dependent on **natural resources to one that is innovation-based**
- Structures for commercialization are in place but **poorly resourced (broaden RM)**
- There is need for **mainstreaming** commercialization of research in Universities **(Culture change - entrepreneurship) – VCs/councils will be key – i.e., leadership**
- Industries and universities need to talk with each other **(*Linkages*)**
- Research should be appealing to industry/users **(applied research) *i.e.*, fit-for-purpose**

WAY FORWARD

- Universities need to be **proactive (ivory tower)**
- Invest in **internal capacity** (IP, marketing and entrepreneurial training) – **avoid early disclosures**
- Engage in high quality relevant research even if not **cutting edge**
- Broaden promotion criteria **(innovate or perish)**
- Focus on home-grown solutions for Kenya/Africa
- Build multidisciplinary through strong collaborations
- Go beyond **IP** filing to licensing
- Invest in **training and infrastructure** to attract best of best

Restructuring

- Universities must **ready *themselves*** *for* restructuring (i.e., **a common term in private sector**)
- Mergers, acquisitions and strategic alliances, downsizing and outsourcing **may become unwelcome vocabulary in Universities**. It will be either **reinvention or extinction**
- Maseno can become a **research intensive university** molded on your:
- Unique and differentiated profile,
- Mission and setting,
- Characteristics of your academic community
- Scope of your constituent colleges, schools and departments, and;
- Your willingness to commit to public service and community engagement
- **developing your own niche (Lake??)**

"Wisdom acquisition is a moral duty. It's not something you do just to advance in life" - Charlie *Munger*
(American businessman, lawyer, investor, and philanthropist)

REACTION(S) FROM THE PLENARY

Structures should be put in place in Kenyan Universities in order to mainstream commercialization of research outputs.

KENYA'S INSTITUTIONAL AND NATIONAL RESEARCH MANAGEMENT STRUCTURES AND POLICIES

BY ARCHBISHOP TITUS ZAKAYO INGANA

HEAD: ST&I POLICY DEPT, DRST, SDUE&R, MOE

CURRENT CONVERSATION

- Gazetment of Professors to weed out those who are not qualified-how GoK will do it through CUE promotion criteria
- Need for specialized University e.g. allowing KSMs, KRA to offer Degrees (governance and management issues)
- Kenyan Universities Association instead of Vice chancellors forum
- Evolving Kenyan Universities into Centers of entrepreneurship and innovation through effective R&D
- Overcome the Dichotomy of Brain Drain and Brain Gain

What about managing by Stick of Moses, pieces of iron and Vision careers?

2018 experience and Dilemma

- Through DAAD-NRF Research Agreement
- Over 90 candidates interviewed to pursue PhD Studies in Germany
- 30 Funding chances/Scholarships available
- Pass mark-8.5/10
- Only 26 taken…4 Chances lost--the Dilemma

AESOPS' Fable in Change management

- The Crow and the Pitcher (change being provoked by pressure or necessity)

DEFINITION OF RESEARCH AND DEVELOPMENT

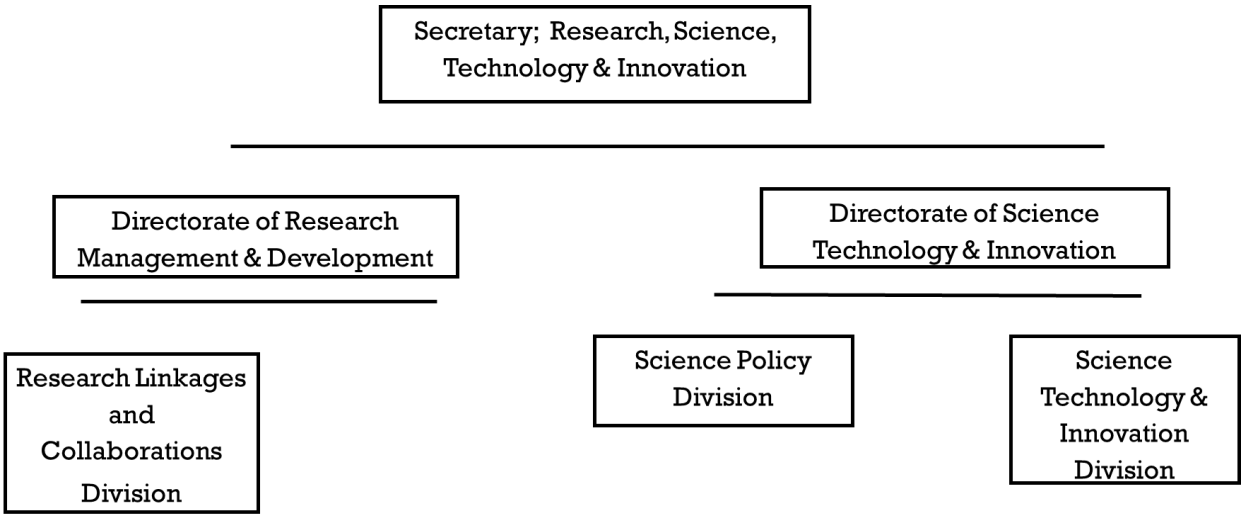
"Research and development, known in Europe as Research and Technological Development, refers to innovative activities undertaken by corporations or governments in developing new services or products, or improving existing services or products. Research and development constitutes the first stage of development of a potential new service or the production process".

INTRODUCTION

- Research and Development (R&D) involves the development, dissemination, transfer and utilization of ST&I in all sectors of national development
- The coordination of R&D within the larger national innovation system has been key towards the realization of a knowledge-based economy
- Key research areas: Tourism; Agriculture; Manufacturing; Whole sale and retail trade; Business process outsourcing (BPO); and Financial services
- R&D in biotechnology, value addition, manufacturing, Information and Communication Technologies (ICT) will result in industrial and entrepreneurial development with new products and services
- R&D should determine the ability to provide clean water, good health, adequate infrastructure, and safe food and also support the creation of high quality and better paying jobs, produce generics and help to dramatically cut the cost of healthcare to the poor
- The Kenya Government has been implementing the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) since 2003, as its medium term plan to address development challenges of economic growth and poverty alleviation.
- In this regard, Universities are seen as key elements of Research and Development system and ought to serve both as platforms for human capital development and seed-beds for innovations and business incubation
- Research is indeed part of the Knowledge, technology, innovation generation that has become one of the key drivers of sustainable economic growth and competitiveness
- Thus as Kenya strives to be a Knowledge-based economy it will depend on high investment in research and development (R&D), education and training, the presence of high-quality scientific research institutions, extensive relationships between governments, academia, and industry and the protection of intellectual property.

RESEARCH MANAGEMENT STRUCTURE

Organogramme for Research management



STRUCTURE OF RESEARCH, SCIENCE, TECHNOLOGY AND INNOVATION SYSTEM

SECRETARY OF RST&I

- Oversee the development of Research, Science, Technology and Innovations (RST&I) Policies and Regulations.
- Spearhead integration of RST&I in the Big 4 Agenda and other national development strategies.
- Facilitate resource mobilization to support Research Infrastructure and equipment in RST&I in Public Universities.
- Spearhead the investment for Science and Technology Parks
- Initiate the Establishment of Innovation Demonstration Centers at Public Universities and research institutes/organizations.
- Liaise with local and international stakeholders in development Partnership in RST&I at local, regional and global levels
- Facilitate the Establishment of Centers of Excellence at Public Universities
- To ensure competitiveness on RST&I locally, regionally and globally
- Oversee the development and maintenance of RST&I repositories.
- Ensure compliance to Global obligations in RST&I

DIRECTORATES WITHIN RST&I

Two Directorates within RST&I

1. **Research, Management and Development (DRM&D)**

Functions

- Initiate the establishment of linkages in science and technology with local and international partners ;Public-Private Partnerships in Research and Development;
- Ensure implementation of Global Obligations in Science and Technology and Science Diplomacy;
- Coordination of Resource Mobilization for Research and Development;
- Ensure the update of research activities and research infrastructure;
- Coordinate monitoring and evaluation of scientific and technological activities in the country;

2. **Science and Technology and Innovation (DST&I)**

Functions of DST&I

- Initiate the development of Research, Science and Technology Policies and Strategies;
- Review the implementation of Research, Science and Technology Policies and Strategies;
- Provide technical/expert policy support to stakeholders in Science and Technology Sector;
- Promote and disseminate ST&I findings through organized workshops, exhibitions, shows and journal publications and scientific awards;
- Develop Science, Technology and Innovation Statistics and Repositories;
- Linkages between Academia/Research, Industry, Government and Society.
- Facilitate Evaluation of the National Technology Transfer System in Universities and Research Organizations;
- Mainstream Intellectual Property Management with respect to ST&I;

CONTRIBUTION OF RESEARCH TO THE ECONOMY

The System of National Accounts (the 2008 SNA) explicitly recognizes that expenditures on research and experimental development (R&D) should be recorded as capital formation in addition to recording many acquisitions of software and databases, mineral exploration, and entertainment, artistic and literary originals as capital formation.

Assessment of intellectual property products considers the costs for purchased patents, long-term licenses or other intangible assets used in Research and Development (R&D), and which are in use for more than one year ((OECD, 2009).

Data from the economic survey shows that the value of intellectual property products rose from Ksh 22.3 billion in 2013 to 34.37 billion in 2016 accounting 2.8 % of the total capital formation in Kenya.

INTELLECTUAL PROPERTY PRODUCTS AND CAPITAL FORMATION

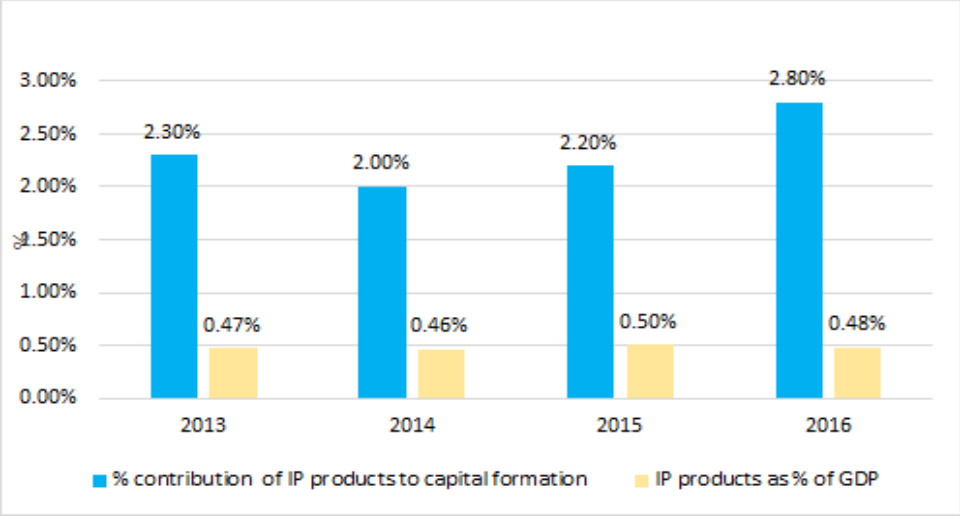


Figure: Contribution of IP products to capital formation

Source: Kenya Economic Survey, 2017.

POLICY CONTEXT

- The Second Medium Term Plan of Vision 2030 (MTP2, 2013-2017) focused on transformation of the country with Science, Technology and Innovation sector having an overarching theme, *"Harnessing Science, Technology and Innovation for Regional and Global Competitiveness"*
- MTP2 recommended the intensification of coordination of technology, innovation, research, development and commercialization as a flagship programme for sustained productivity growth.

- Customized to the Vision, the country formulated ST&I Policy framework, consisting of the ST&I policy and strategy (2008) and enacted the Science, Technology and Innovation Act in 2013, (ST&I Act, 2013) that emphasize the need for a coordinated functional innovation system in which universities (and public research institutes) play a leading role in knowledge and technology generation through research and development (Bolo *et* al., 2015a[2]; GoK, 2013b[3]).

ST&I ACT 2013

- The ST&I Act, (2013) was mainly to address deficiencies in the development of ST&I in the country through a coordinated creation of infrastructure, institutions, capacity for R&D, technology transfer and diffusion.

- The Act also established funding policies and mechanisms for research and technological innovation, reviewing, evaluating and enhancing the efficient performance of science and technology system.

- It also focused on promoting the mainstreaming of science and technology within all sectors of the economy and ensuring they are taking hold.

- The Act created three strategic institutions to promote research, development and innovation in Kenya through improved steering and financing mechanisms.

ST&I Act 2013 established:

- **National Commission for Science, Technology and Innovation (NACOSTI)** – with enhanced mandate to regulate, plan, coordinate, develop, monitor and evaluate, assure quality, set research priorities and advise the Government on all matters of ST&I related activities;

- **Kenya National Innovation Agency (KENIA)** - to develop and manage the National Innovation Systems, investing in research infrastructure and support mechanisms to facilitate the commercialization of research discoveries and other enabling technologies needed to conduct world-class research, as well as to attract and retain highly qualified researchers and;

- **National Research Fund (NRF)** - to mobilize and manage financial resources at 2% of the country's GDP for R&D. The Fund is to be used to create knowledge, innovation and development in all fields of science and technology, including indigenous knowledge.

ST&I ACT 2013 FRAMEWORK

Emphasizes the following:

- Development of an efficient R&D infrastructure;
- Strengthening networks (through Triple helix type 4) between higher education, academic entrepreneurs, technological institutions, and local industries in support of R&D projects, technology transfer, the provision of risk capital for new innovative companies, university infrastructure, micro-financing for start-ups, seed coaching and stipends for academic entrepreneurs.

ST&I SECTOR POLICY ANALYSIS

National Research & Development

- The heightened interest in STI is clearly visible in the *Vision 2030 and the Big 4Agenda.*
- The Science, Technology and Innovation Act passed in 2013 contributes to the realization of *Kenya Vision 2030*, which foresees the country's transformation into an upper middle-income economy with a skilled labour force by 2030.
- The act may be a 'game-changer' for Kenya, which has not only created a National Research Fund but also, critically, made provisions for the fund to receive 2% of Kenya's GDP each financial year.
- This substantial commitment of funds should help Kenya raise its Gross Domestic expenditure on Research and & Development (GERD) and GDP ratio well above 0.79% (2010).

Number of Researchers

- Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, as well as in the management of the projects concerned.
- This indicator is presented as head count and full time equivalents (FTE) for researchers.
- The most recent data that was available was from the 2010 ASTII survey. Table 1 shows the number of research personnel in selected countries in 2010.
- Kenya has a **13,012** researchers who translated to 9,305 FTEs.
- The number of researchers per million in Kenya stood at 322.7 in 2010.

- The number of researchers is below those in South Africa (37,901) and Singapore (36,561).
- It is notable that the FTSE numbers for Singapore are high indicating that the researchers are engaged more in research activities than in South Africa and Kenya.
- The number of researchers per million is also very low in Kenya compared to both South Africa and Singapore.
- Men accounted for 9,674 (75%) of researchers in Kenya suggesting low participation by women in research.

	Researchers (FTE)	Researchers Per million (FTE)	Researchers per Million (HC)	No of researchers (HC)	Female Researchers (HC)	Male researchers
South Africa	18,719.6	362.6	734.2	37,901.00	15,794.00	22,107.00
Kenya	9305	230.7	322.7	13,012.00	3,338.00	9,674.00
Ethiopia	3701	42.3	83.2	7,283.00	477.00	6,806.00
Singapore	32,030.6	6,030.6	7,198.5	36,561.00	10,712.00	25,849.00
Uganda	1,262.7	38.1	85.2	2,823.00	687.00	2,136.00

BUILDING RESEARCHER POOL FROM STEM

In Kenya University placement of students in the different categories is skewed towards humanities and arts courses than science based courses. In 2016 almost three quarters of the courses/programs offered by both public and private universities were arts and humanities followed by business related courses.

The large proportion of Kenyan enrolment concentrated in non-science-related fields could contribute to a situation in which many graduates are un-or underemployed following the completion of their studies.

Low STEM enrolment is due to the following:

- Costs associated with delivering STEM related programs are higher than those associated with delivering courses in the social sciences and humanities
- Universities do not have sufficiently qualified faculty with the capacity to teach STEM related programs of sufficient quality to meet recognized standards.
- CUE shows that less than 20 percent of faculties in these disciplines hold a PhD (CUE, 2016).
- According to Raza et al (2016), only 29 percent of Sub-Saharan Africa(SSA) research output is concentrated in STEM related fields, compared to 70 percent in Malaysia and Vietnam.
- Another factor is the low demand on the part of aspirant tertiary students for STEM programs, in part a consequence of the relatively low number of students transitioning from secondary education with the skills and qualifications required for enrollment in STEM programs.

Course cluster	Number of students
Business, Law, Education(Arts), Economics	69,384
Basic Sciences, Applied Sciences and Education Sciences	59,177
Agriculture, Health, Food and Natural Resources Management	39,591
Humanities	35,694
Applied Social Sciences and Arts	24,634
Built Environment and Design	18,689
Engineering and Surveying	12,263
Health (Medicine, Dentistry, Pharmacy, Veterinary)	2,819
Architecture	750
Total	263,001

PROGRAMME DESIGN

- **Programme :** Strengthen Science, Technology, Engineering and Mathematics (STEM) Education

Projects/Actions:

1. Review the University and TVET placement criteria to ensure that 60% of eligible students are placed in STEM Program
2. Develop and implement mentorship program in TVET, primary and secondary Schools
3. Build the capacity of academic staff in public universities in SET
4. Provide scholarships and bursaries for students pursuing STEM
5. Develop and implement activities on scientific fairs at both primary and secondary to encourage learners pursue ST&I

MANAGING RESEARCH THROUGH EFFICIENT GOVERNANCE

POLICY PRIORITY : GOVERNANCE AND ACCOUNTABILITY

- **Goal:** A coherent legal, institutional and regulatory framework to support the growth, development and utilization and coordination of ST&I
- **Policy target:** A regulated ST&I sector
- **Programme 1**: ST&I Policies and Regulations

Projects/Actions

1. Review the Science, technology and innovation policy.
2. Review the Science, technology and innovation Act, 2013
3. Develop regulations for the implementation of the ST&I Act, 2013
4. Develop Entrepreneurial and Innovations Policy

Programme 2: Access to Data and Information

Projects/Actions

1. Establish a National Science, Technology and Innovation Observatory
2. Update and maintain the ST&I Observatory

PROGRAMME DESIGN

1. Establish an integrated Knowledge Management Information System to inform the country on the ST&I profile.
2. Conduct regular and scheduled R&D and Innovation surveys
3. Publish biennial ST&I indices reports
4. Promote inter university and TVET competition in STI

- **POLICY PRIORITY: PUBLICITY AND AWARENESS CREATION IN ST&I**
- **Goal:** Elevate the national profile of ST&I and its application in national development
- **Policy target:** To develop and implement a national integrated awareness creation programme for ST&I that support the development and application of ST&I skills for national development
- **Programme:** Create public awareness, acceptance and support for ST&I

Projects/Actions

1. Hold annual science weeks for all levels of education (annually in August)
2. Hold two roundtable conferences on ST&I annually
3. Show case ST&I best practice in print and electronic media

MANAGEMENT PUZZLE

- Stick of Moses-what do you have?
- Pieces of iron-Who can support you at your level of engagement?
- Vision careers-Who will carry your Vision?

REACTION(S) FROM THE PLENARY

The Ministry of Education should make deliberate efforts to organize for conferences where policy briefs would be presented.

MULTI-DISCIPLINARY AND MULTI-INSTITUTIONAL RESEARCH

By Dr. Roselida Owuor

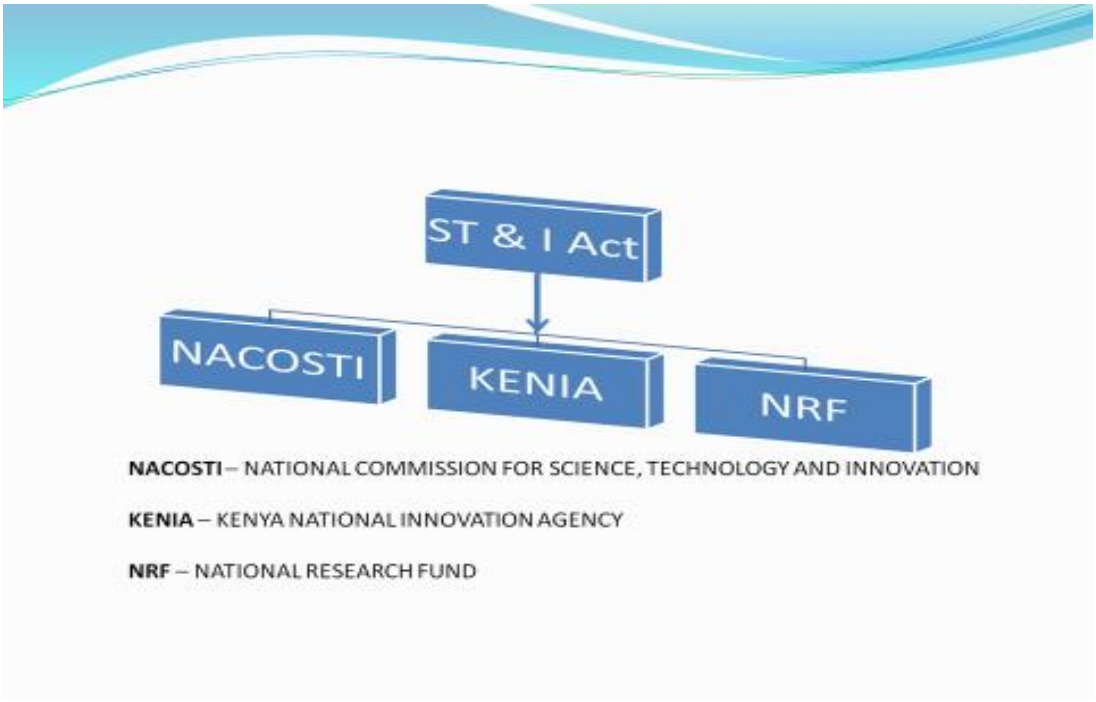
Deputy Director of Research (NRF)

Outline

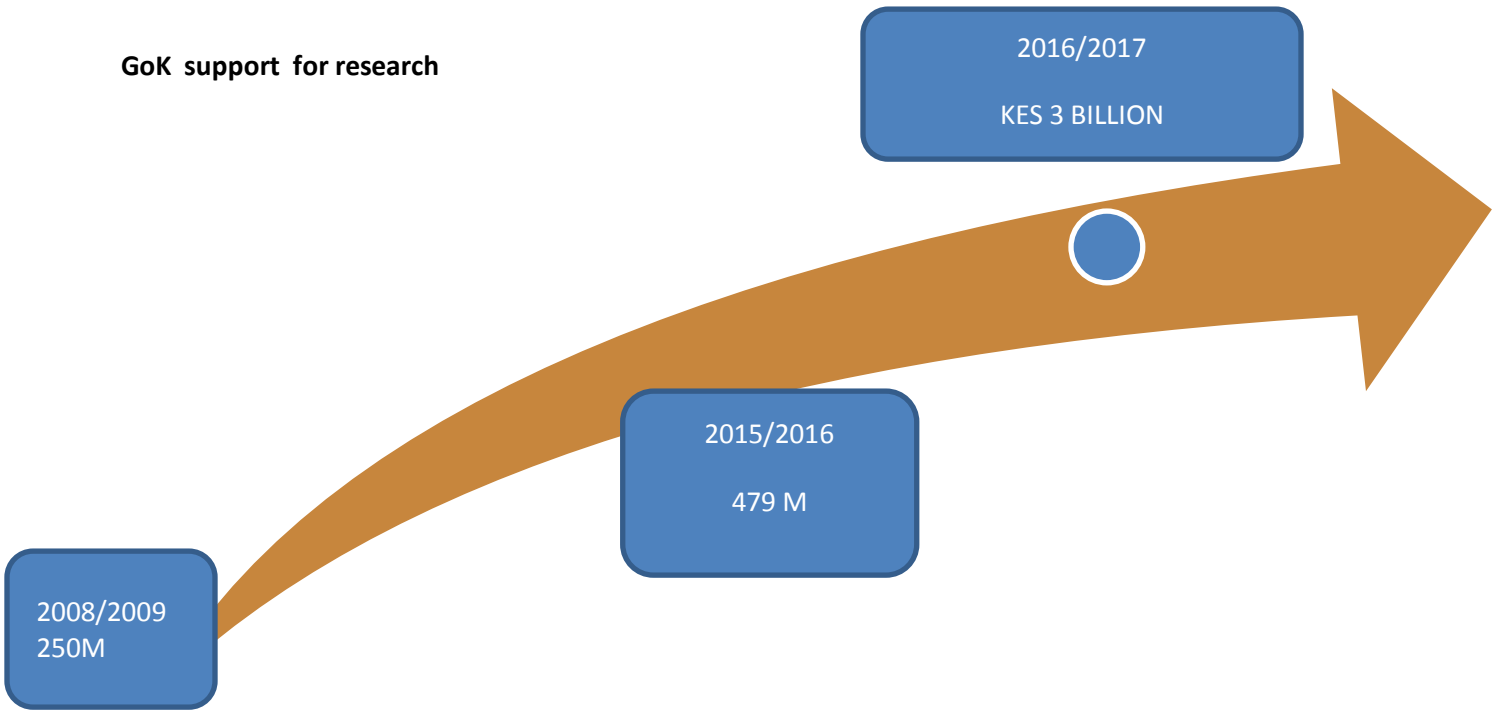
- Introduction
- GoK support for Research
- Categories funded by GoK
- Why multi-disciplinary and multi-institutional Research
- What to consider in Multi-disciplinary and multi-institutional research
- What has been funded
- Conclusion

Introduction

- It has been evidenced globally that knowledge based economies are driven by well funded and structured research and innovation systems
- Article 11(2) of the Constitution emphasizes that the State shall:
- recognize the role of science and indigenous technologies in the development of the nation
- promote the intellectual property rights of the people of Kenya
- Article 33 (1) (c) on freedom of expression acknowledges academic freedom and freedom of scientific research
- Science, Technology and Innovation Policy encourage entrenchment of product oriented multi-disciplinary approach to R&D
- Science, Technology and innovation Act, 2013 is in place to harmonize the application of research, science, technology and innovation towards the realization of development agenda



- NACOSTI, KENIA and NRF work with all stakeholders in the Government, research institutions, private sector and academia in order to transform Kenya from a factor-driven economy into an innovation-driven economy.



Financial Year (FY)	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
Research Fund	379M	497M	3B	2.7B	1.84B

- The growth in funding shows positive trend towards attaining the set target for national research, ST&I funding of 2% of GDP as stipulated in the ST&I Act, 2013.

Challenges of government Funding

- Limited resources
- Competition among institutions in the same sector
- Natural calamities such as flood

Funded area

The funded research address the following areas:

a) Sustainable development goals which can be divided into 5 groups namely:

1. Human Rights

- Justice (16), Equity (10), Gender (5)

Economic Development

- Employment (8), Trade (12), Cities (11), Infrastructure (9)

3. Environmental development

- Energy (7), Climate change (13), Oceans (14), Ecosystems (15)

4. Social development

- Poverty (1), Hunger (2), Water (6), Health (3), Education (4)

5. Global Partnership (17)

2. Economic Development

- Employment (8), Trade (12), Cities (11), Infrastructure (9)

3. Environmental development

- Energy (7), Climate change (13), Oceans (14), Ecosystems (15)

4. Social development

- Poverty (1), Hunger (2), Water (6), Health (3), Education (4)

5. Global Partnership (17)

b) Science, Technology and Innovation Strategy for Africa (STISA) -2024

- This Strategy aims at accelerating Africa's transition to an innovation led, knowledge based economy
- The sectors targeted are: Agriculture, health, infrastructure, mining, security, water, energy and environment

- The priorities are: eradication of hunger and food security, prevention and control of diseases, communication, protection of space, build society and generation of health

c) National priorities found in Kenya Vision 2030

- Agriculture and rural development, tourism, manufacturing, financial services, health and life sciences, housing, trade and industry, human resource development, physical infrastructure, energy, environment and natural resources management, space science technology

4. "The Big Four"' Agenda

- Manufacturing, Affordable Housing, Food security and improved nutrition and Health

Categories funded by the Government of Kenya

- Postgraduate
- Multidisciplinary and Multi-institutional Research
- Infrastructure Support
- Bilateral and Multilateral Support
- Innovations
- Conferences, Workshops and Seminars

Why multi-disciplinary and multi-institutional research?

- Break silo mentality
- Promote public private partnership
- Share available research facilities
- Capacity building

What to consider in multi-disciplinary and multi-institutional research.

- Research to focus on the national priority area
- Scientific excellence
- Novelty
- Importance
- Feasibility

- Objectives to be SMART
- Methodology and analytical approach should be explained clearly
- Methods and techniques employed should be appropriate
- Potential impact of the research
- Budget to be aligned to the activities
- Justification of the budget

The following should not be included in the budget:

- administrative cost
- salaries
- lease of offices
- purchase of laptops
- Purchase of desktops
- payment of fees for postgraduate students

Proposals received in 2016/2017FY

	PhD	Msc./MA	MMC	Infrastructure
Proposals received	439	396	511	117
Proposals rejected at screening	24	17	11	0
Reviewed proposals	415	379	500	117
Proposals recommended for funding	207	192	170	58

Projects funded in 2016/2017 FY

Category	No.
Multidisciplinary and multi-institutional Research	158
PhD Projects	202
Msc./MA Projects	185
Infrastructure	21

Proposals received in 2017/2018FY

	PhD	Msc./MA	MMC
Proposals received	662	466	801
Proposals recommended for funding	247	220	444

Projects funded under 'Big 4' Agenda

Research Theme	Collaboration Partners involved	No. of Projects Funded	Funds Invested (Kshs)
Non Communicable diseases	UK Government	8	17,414,737
Food Security	Several Europe Countries	21	64,161,086
Capacity building Kenya/German PhD Scholarships	Germany	54	68,000,000
Manufacturing	East Africa Countries	2	1,000,000
Health Research	Kenya/South Africa	27	58,220,000
Research Infrastructure	Kenya Universities and Research Organizations	16	783,148,764
Multidisplinary Research Projects supporting the Big 4 Agenda	Kenyan Universities and Research Organization	20	252,940,654
National Capacity Building PhD Programs	Kenyan Universities and scientists	30	104,380,430

Conclusion

The Team should agree on the following:

- Roles of the collaborators
- Mode of disbursement of funds to the collaborators from the other institutions during the implementation of the project
- Preparation of the progress and end of project reports
- IP management

REACTION(S) FROM THE PLENARY

To obviate the challenge of proposal rejection by NRF, the researchers should adhere to the set requirements as indicated in the call for proposal documents.

THE ROLE OF RESEARCH IN SOCIO-ECONOMIC DEVELOPMENT

By Dr. Mary Aswan Ochieng (Department of Sociology and Anthropology)

Jeffrey Sachs (2005):

- The end of poverty: How we can make it happen in our lifetime.
- Launched the MCI in 11 cities across SSA including Kisumu city and MVI in Sauri Village in Kenya and other villages across SSA.
- This was a flagship project done in partnership with the Earth institute of the University of Columbia and the United Nations.
- Carried out a comprehensive needs assessment and developed strategies for achieving the MDGs.
- Pay close attention to the research design.
- Involve our research subjects as active participants in our research.
- Dissemination of findings – research findings can only make an impact if they are utilized by relevant stakeholders.

Why research for socio-economic development?

- Research aims at increasing our understanding and equips us with the knowledge necessary to solve problems and make decisions.
- It provides policymakers with hard data on which they can base their decisions – what works.
- Applied research – goes beyond extending knowledge to problem solving.

Who is involved and who is in control at each stage of the problem solving activities?

- Research funders are key drivers in determining the focus, methods and interpretation of findings of research – power and participation.

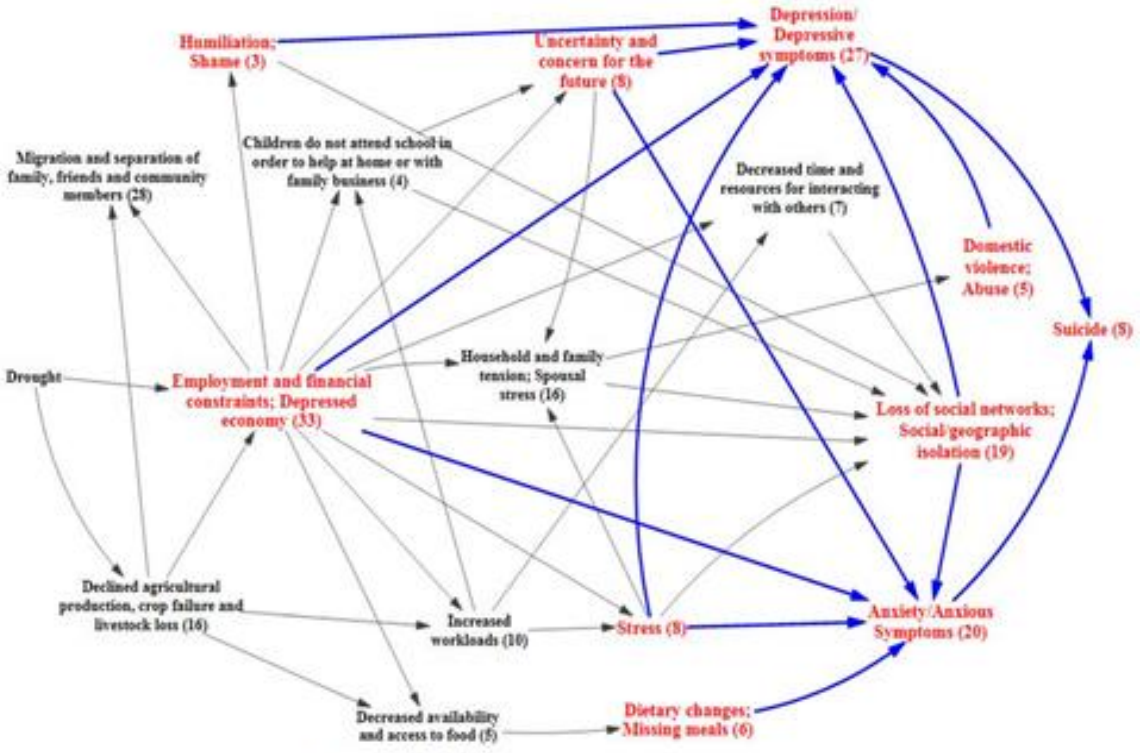
However

- If certain categories of stakeholders (e.g. the socially disadvantaged) are not considered, their interests and problems (as they define them) are unlikely to be investigated (standpoint and situated knowledge).
- This will then affect the focus of research, how it is conducted and the research findings.

- This could call for action/participatory research, innovative methods of data collection that sees subjects as active agents in the research process
- As countries become more economically developed and egalitarian, men and women become more different and the less they want the same things – in terms of personality traits and choice of subjects (STEM) and career (equality)
- The more equal men and women are, the less they want the same things.
- Consider resistance from your research participants and the unintended consequences of interventions (VMMC).

Which design and which methods?

- Tensions between the 3 research cultures.
- Transformative research designs move from purely descriptive to causal research.
- We should rethink our research designs and consciously adopt MMR and research for policy.
- Identify the causal mechanisms and decide where to intervene along the causal path.



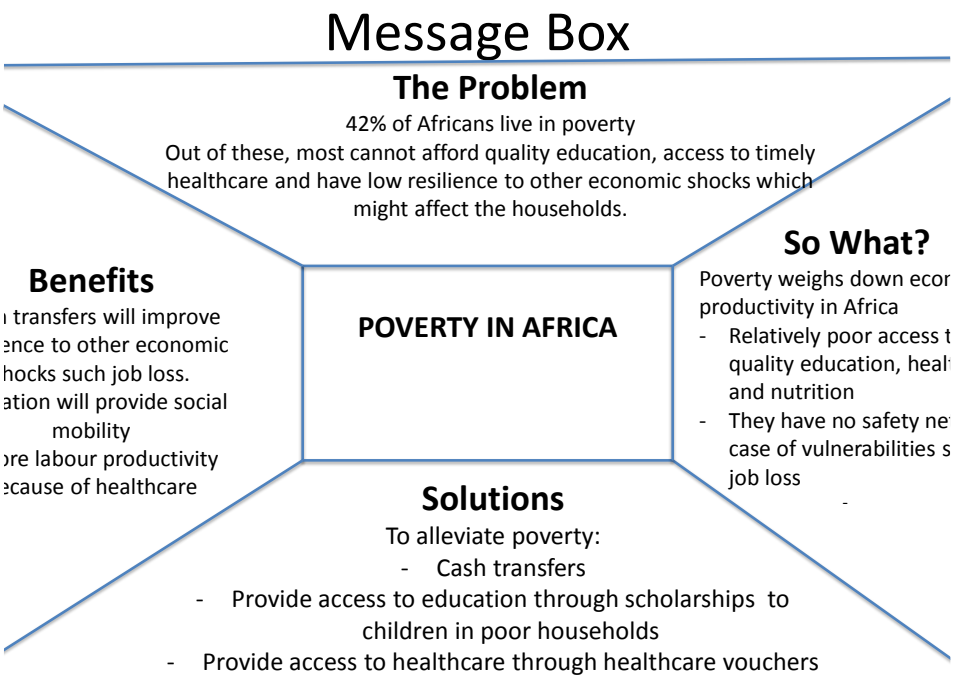
Source: https://understandingsociety.blogspot.com/2016/02/causal-diagrams-and-causal-mechanisms.html

Which design, which methods?

- Randomized control trials provide the highest quality and most reliable answers to what works and what does not (MCI and MVI).
- Longitudinal studies e.g. to establish long term intergenerational and intragenerational (chronic) poverty, cyclical poverty and short term poverty

Dissemination of research findings:

- Social and economic progress depends to a large extent on the quality and utilization of research evidence by government, policy makers, social groups, etc.
- Researchers should share their research findings with policy makers, community leaders and other stakeholders so as to encourage uptake of evidence-based interventions (Fatai)
- Ensure that results are presented in a way that non-researchers can understand.
    - This can be done through blogs and op-eds, policy briefs, the message box, etc



REACTION(S) FROM THE PLENARY

The Government should be keen on research proposals which can make significant contribution to humanity.

GUIDING PRINCIPLES IN POSTGRADUATE TRAINING AND SUPERVISION

By Prof. J. O. Agure

Dean School of Graduate Studies

Outline

- Recruitment and Admission
- Students and Supervisors
- Supervision and Monitoring
- Assessment and Publications
- Benchmarking and Best Global Practices
- Feedback

Recruitment and admission

- Approved Degree Programmes and Competent Faculty
- Open and Transparent; Merit
- Ability to pay
- Faculty Responsibility

Student supervision

$x2 + y2 = z2$
And for $n > 2$; $xn + yn = zn$

- Research Methodology
- Concept paper and Proposal, whose responsibility?
- student or supervisor?
- Progress, Monitoring Progress
- Two Supervisors, Why? student: staff ratio
- Conflict student/Supervisor
- Progress Reports
- Collaboration, student-staff Exchange

Assessment and publications

- Examining Thesis, grading? Rewarding?
- Ownership of thesis; Supervisor or student?
- Where to publish; Journals, peer reviewed Journals
- Recommended Journals

Bench marking and best practices

- Best Practices
- Co-supervision, collaboration, local, regional and international
- Feedback from Alumni

Discussion and way forward

- Discussion
- Way forward

REACTION(S) FROM THE PLENARY

- Graduate students should be encouraged to publish their writings in peer reviewed journals which have a credible impact factor. There are good peer reviewed journals which promote students work.
- What the sanctions for graduate students who do not adhere to the stipulated time-limit for them to complete their graduate studies.
- Supervisors and students should be fair to themselves. They should not create hurdles for others when they complete their graduate studies especially the ones who complete their PHDs. They should be selfless to assist others who are in the process of studying for these higher degrees.

RESEARCH FUNDING CHALLENGES AND OPPORTUNITIES IN AFRICA

By Joseph Njogu, CEO Research Beeline Ltd

AICAD Head office, (JKUAT), Suite 10, Juja, Kenya

Let's look at…

1. Challenges
2. Realities
3. Opportunities
4. Ourselves in the context of 1,2 and 3

CHALLENGES

- Lack of resources – Limited funding
- Lack of training – Programs and facilities for training on career development
- Lack of facilities – Like state of the art labs
- Mentorship – Programs not well established, professors too busy
- Lack of government interest – To use research for development
- Poor personal motivation to pursue research – other better options for our man-hours

Challenges could be

- Systemic
- Institutional
- Individual

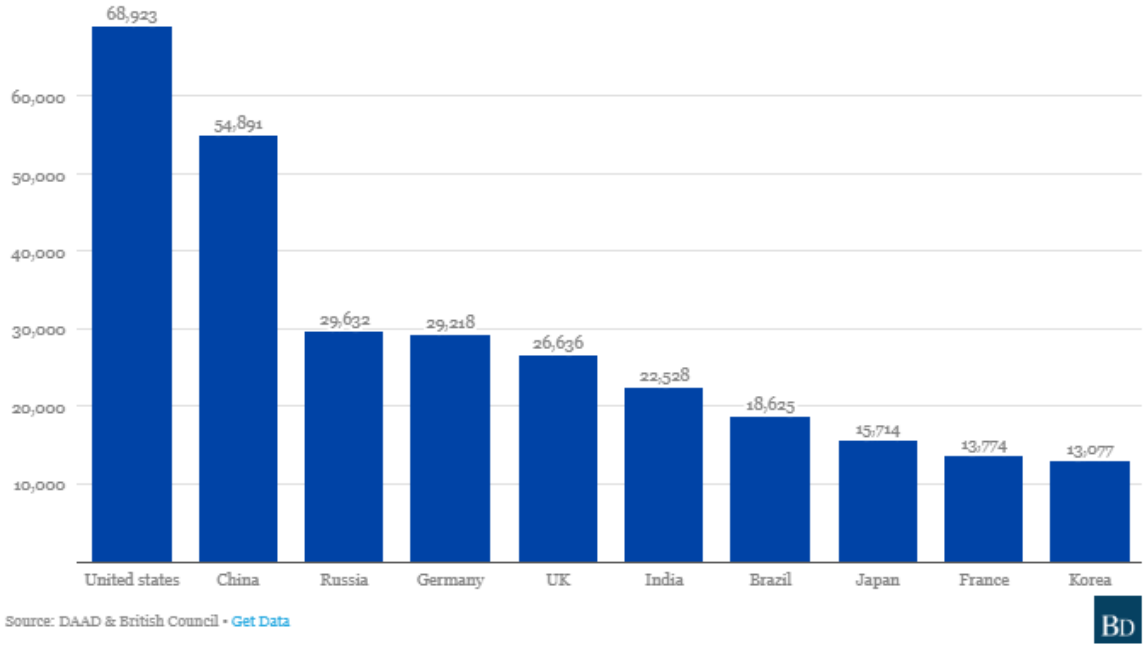
REALITIES

Reality 1.

Critical low levels of research funding by government.

Research and development expenditure (% of GDP)

Country	% spend of GDP	Year last data obtained
Israel	4.27	2016
South Korea	4.23	2016
USA	2.74	2016
OECD countries	2.4	2016
European Union	2.3	2016
South Africa	0.8	2015
Kenya	0.76	2010
Sub-Saharan Africa	0.5	2007



Reality 2

Budget cuts and shrinking capacity for Universities to generate income

Reality 3

Knowledge is now a key economic driver and Higher education has become "absolutely necessary"

"We live in a time when knowledge is ever more vital to our societies and economies, in a world of rapidly circulating capital and people and of revolutionary communication technologies.

Knowledge is replacing other resources as the main driver of economic growth, and education has increasingly become the foundation for individual prosperity and social mobility."

Words of Drew Faust (Harvard University president, 2007-2018)

Reality 4

Our career demands of us to engage in research

According to a report by CORE Africa

What motivates researchers in Africa

- Career choice – 68.6%
- Personal interest – 37.1
- Funded research opportunities – 12.4%

When forces come to shove....

THE WORLD UNIVERSITY RANKINGS

PROFESSIONAL JOBS SUMMITS RANKINGS STUDENT

Kenya short of 'impossible' target for all lecturers to get PhDs

Government agency has said that academics without a doctorate will have to leave their roles – but this could account for two-thirds of the workforce

April 16, 2019
By Anna McKie
Twitter: @annamckie

Kenyan universities are heading for a crisis as they look increasingly unlikely to hit a target for all lecturers to have a doctorate by this autumn.

A report from the country's Commission for University

Magoha orders probe of local universities' PhDs amid quality concerns

TUESDAY MAY 7 2019

Reality 5

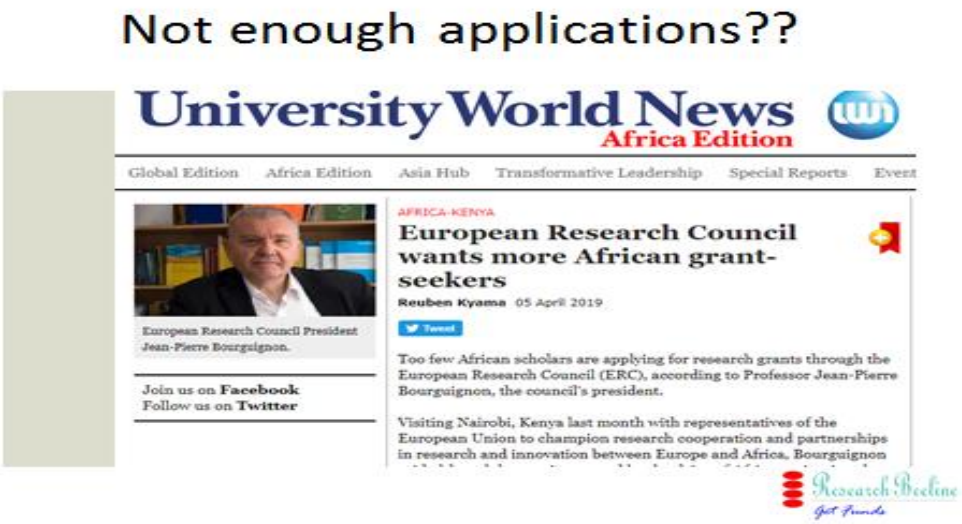
Research landscape is becoming all the more complex

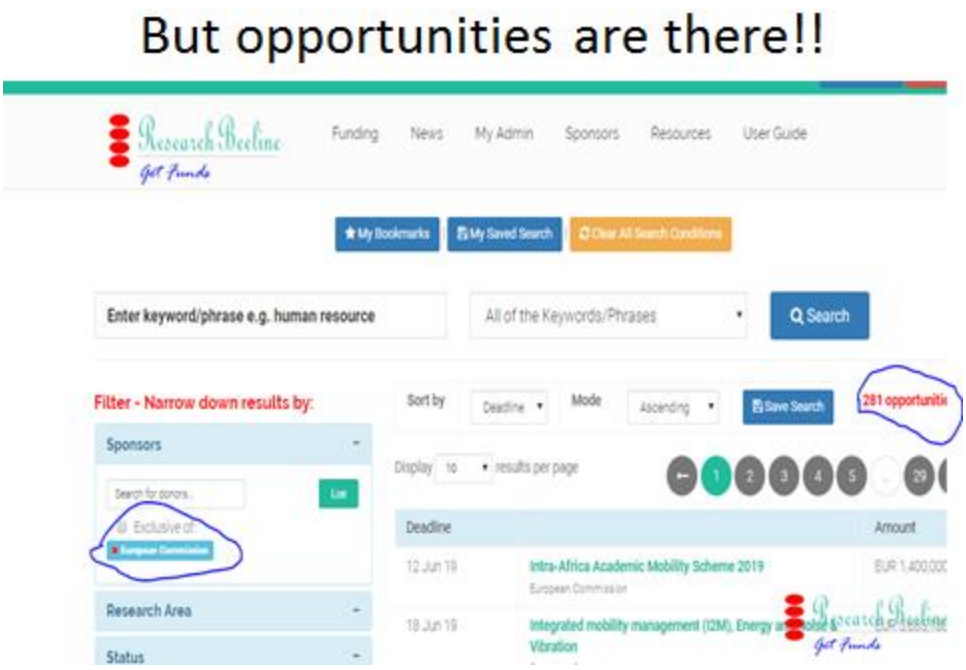
"Today's Research is less about the pursuit of knowledge and advancement of learning for its own sake and more about delivering economic benefits and an improved quality of life for all sections of society thus more complexity. Bigger questions need bigger teams, bigger resources (equipment, databases, etc.) and more collaboration.

In all universities, the increasing student numbers and teaching requirements mean less time for research and there is little internal money to support research. So, research needs external funding"

Words of Gordon Todd and Randolph Haggerty

OPPORTUNITIES





Diversity of funders

- Local funding - Vice Chancellors kitty, National Research Fund
- Regional - IUCEA
- Pan- African funding program- eg AU, AAS, ADB
- Professional organizations – RICS, ESOMAR, MSI
- Corporates – GSK, Nestle,
- Foundations Melinda Gates, Voxwagen Stiftung
- Governments – NIH, Ukaid, DFID, DANIDA
- Development agencies – eg World Bank, UNESCO
- Consortiums – RUFORUM, FARA
- And many more……. And, all come with own objectives,

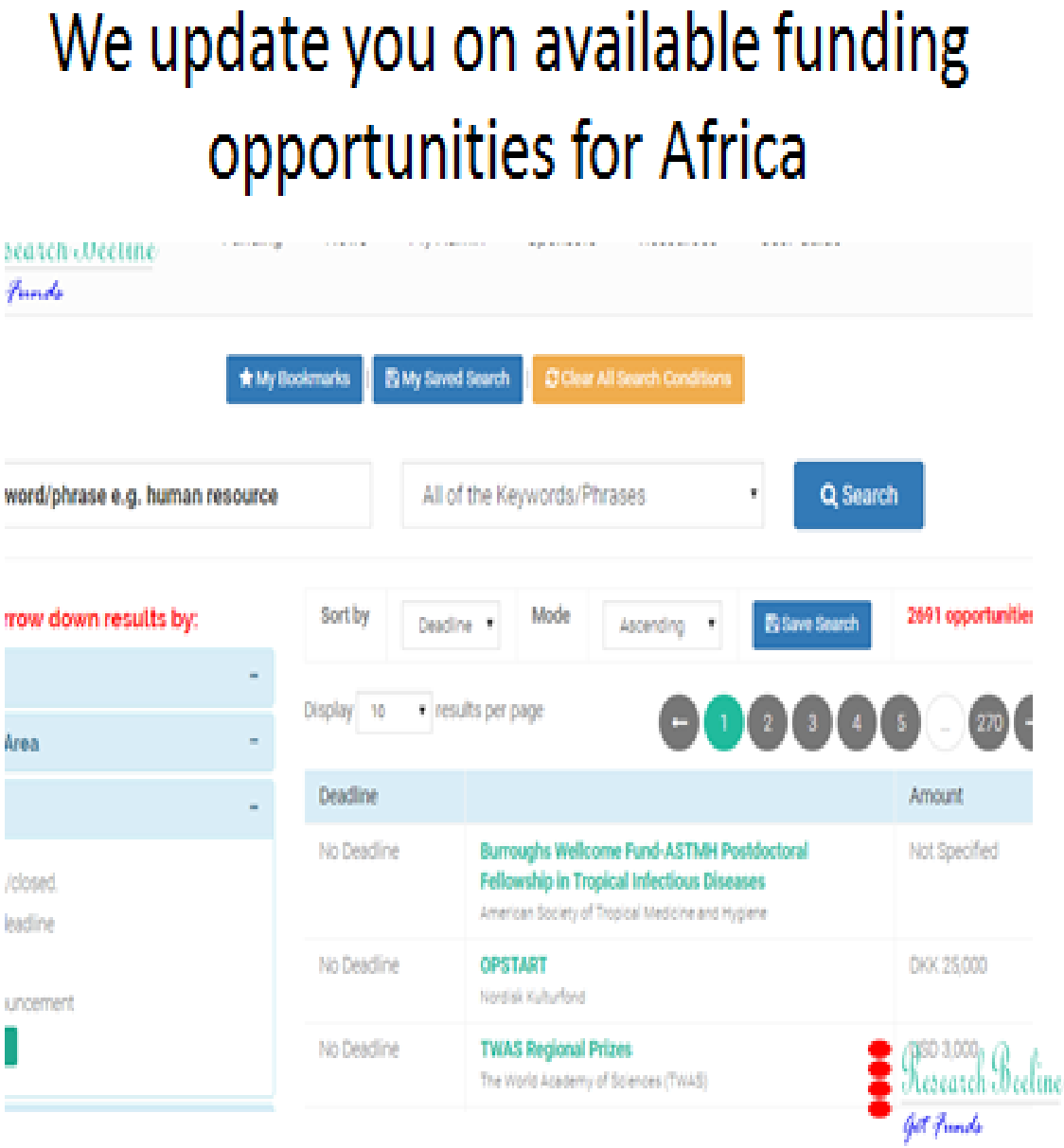
Welcome to Funds Beeline

The term beeline refers to the shortest and most direct route between 2 points.

Researcher----------RB----------Opportunities

www.researchbeeline.com

www.fundsbeeline.com



TYPES OF FUNDING

- [ ] Access to laboratories and Libraries
- [ ] Awards and Prizes
- [ ] Career development for individuals
- [ ] Clinical trials
- [ ] Collaborations and partnerships
- [ ] Competitions
- [ ] Conference/workshops hosting
- [ ] Consultancy
- [ ] Development project grant
- [ ] Early career grants and fellowships
- [ ] Equipment grants
- [ ] Innovation grants
- [ ] Institutional research grants.
- [ ] Institutional support.
- [ ] Internship/Work-study
- [ ] Masters scholarships
- [ ] PhD Fellowships
- [ ] Post-Doctoral fellowships
- [ ] Prototyping and commercialization
- [ ] Publishing/Editorial/Dissemination
- [ ] Research grants for groups
- [ ] Research grants for individuals
- [ ] Scholarships and fellowships.
- [ ] Thesis and dissertation
- [ ] Training/Course
- [ ] Travel/mobility grants
- [ ] Workshop/Conference attendance

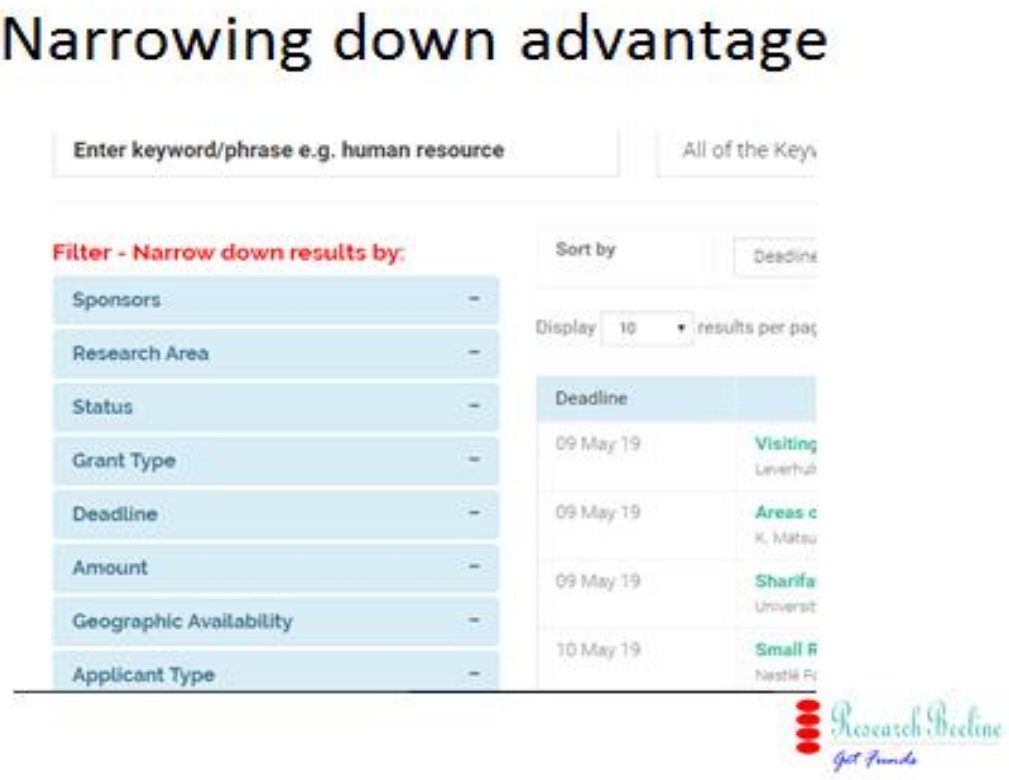
WHY FUNDS BEELINE…

- Support research managers in Africa to advance their institutions' research objectives
- Support researchers with a relevant and reliable source of information specifically targeting the Africa institutions and designed for us.
- Create a useful, reliable and really affordable resource that can easily be integrated in our universities' research systems.

HOW IT'S DONE…

We run a comprehensive database of funding opportunities.

- This involves doing online research (crawling) for opportunities.
- Analyzing and summarizing
- Posting and publishing (on the platform)
- Running quality control checks
- Feedback with grant makers

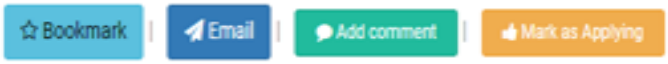


Managing opportunity info

university post

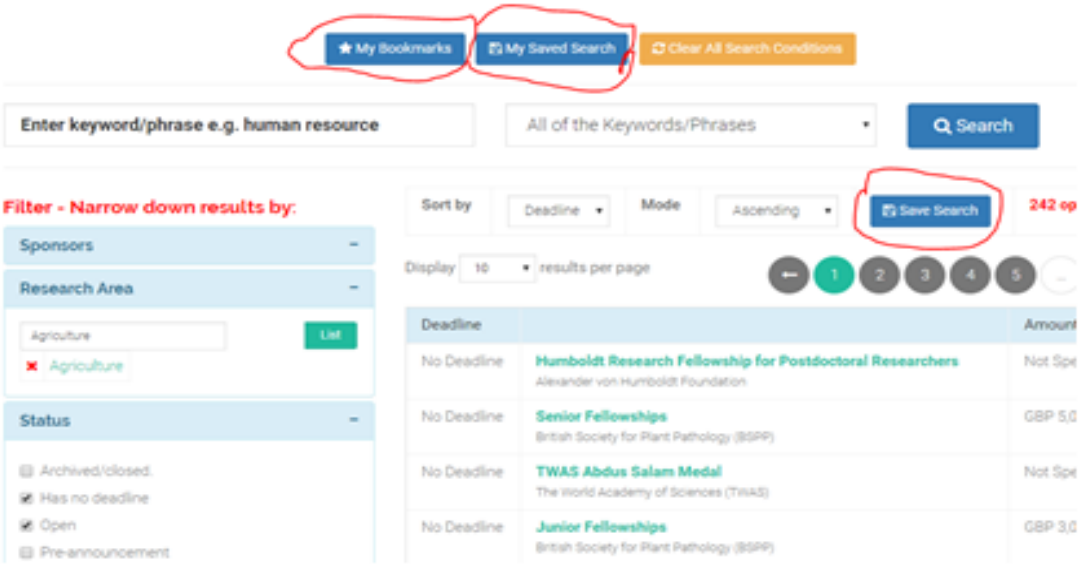
- Collaborative research alone will not be a sufficient justification for a grant. The emphasis should l the diffusion of skills and expertise. Priority will be given to new or recent collaborative ventures

Applications are invited for a minimum of £10,000 and a maximum of £150,000. This opportunity is cf twice a year.



Research Beeline
Get Funds

Save all your searches to ensure you receive fitting opp updates

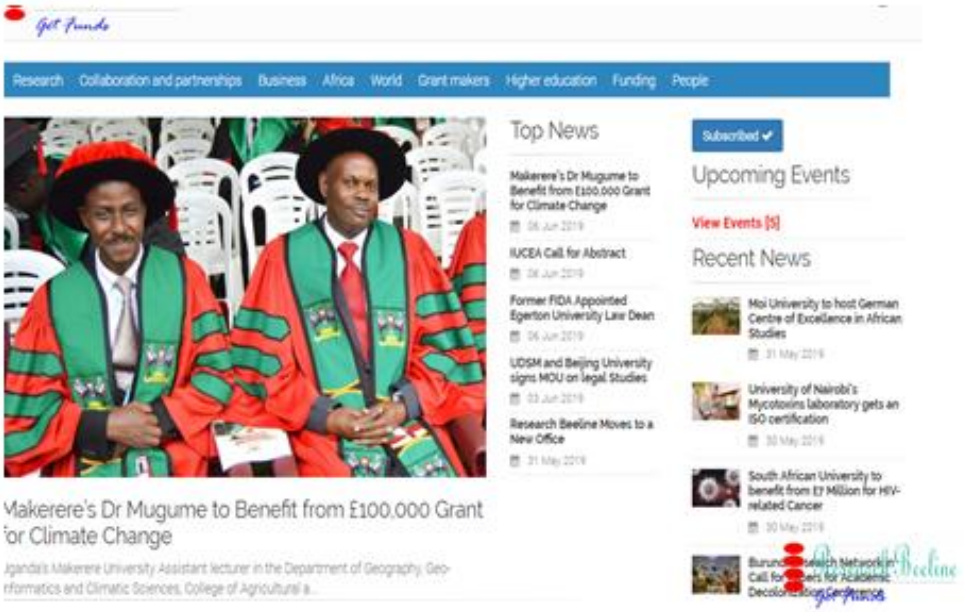


Research Beeline
Get Funds

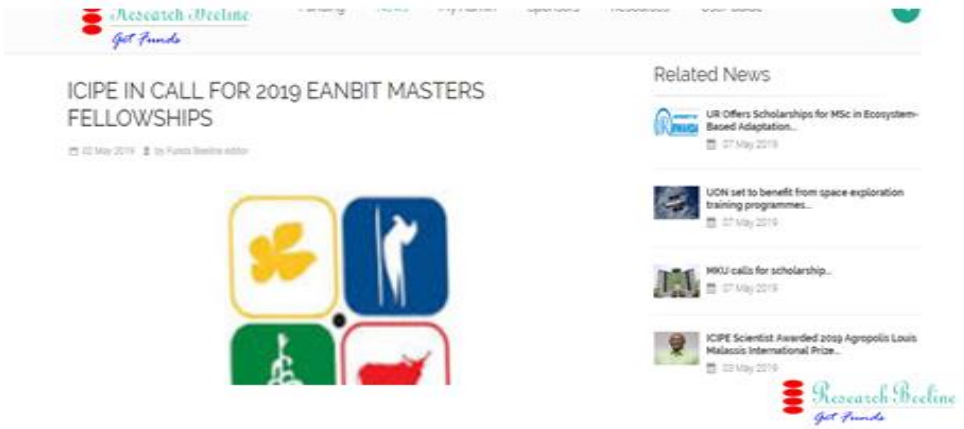
FUNDING LANDSCAPE NEWS…

- Cover news on research developments locally and beyond. -- Could be collaborations, people, research development, policies, up-coming events, etc.
- Manage a newsroom complete with qualified journalists and editors.
- We are a reliable source of research insights across the research funding landscape.

Our news page…



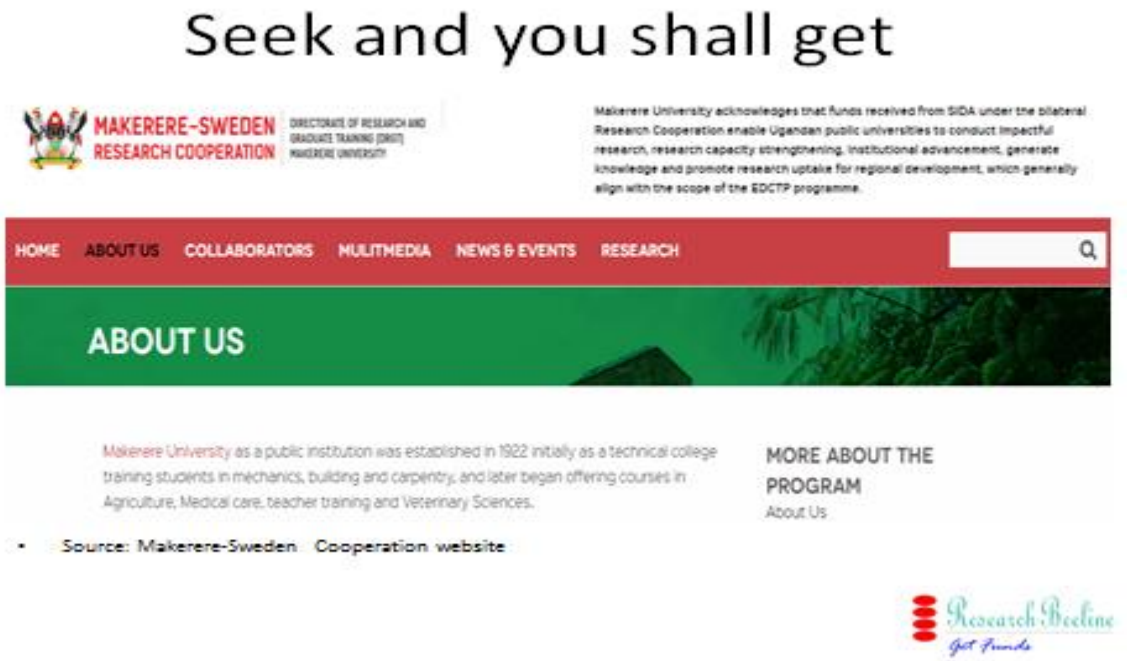
News



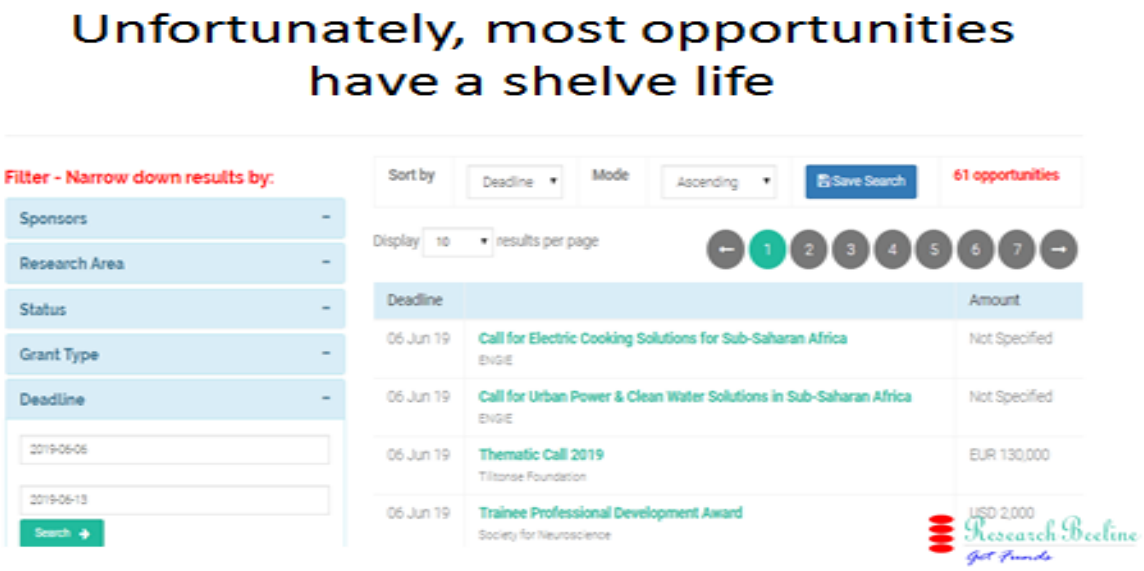
TO ACCESS THE PLATFORM

An institution needs to subscribe – We are really affordable

- Platform is designed to be accessed on computers, tablets, smart phones, among others as long as one has access to internet.
- No other technical requirements needed
- Access by individuals via log-in credentials
- Access not limited by location



CONCLUSION



The train is leaving the station….

- 61 opportunities move to archives in the next 7 days
- 163 opportunities expire in the next 14 days
- This includes opportunities by NIH, PEP, National Geographic
- Some are gone for ever… but some like NIH and National Geographic, you can look forward to the next funding round

Thinking of opportunities for young scholars:

H2020, DAAD, Mastercard, ACE, Fulbright, Chavening, OWSD, …..

OUR CONTACTS

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TRENDS IN FISHERIES RESOURCE EXPLOITATION IN LAKE VICTORIA BASIN

By Chrispine Nyamweya (PhD), sanychris@yahoo.com

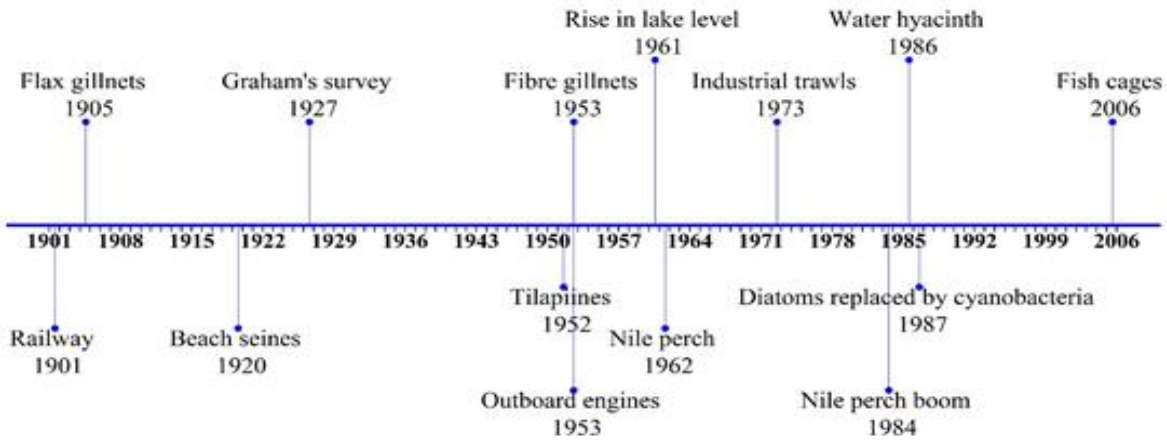
Background

- Lake Victoria is iconic in both its size and function.
- Largest tropical lake
- >70 million people depend on its ecosystem services
- The lake's fisheries annual catch of close to 1 million tons accounts for about 1% and 8% of the world's total and inland capture landings respectively (FAO, 2016)

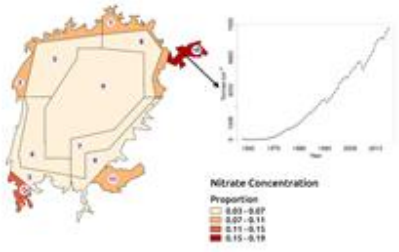
Home to diverse flora and fauna

6/14/2019 2

A chronology of events in Lake Victoria

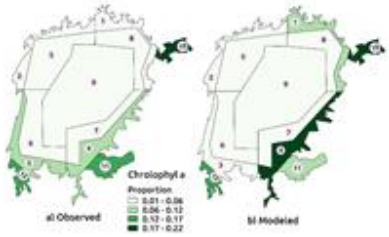


Nitrates and Chlorophyll a distribution

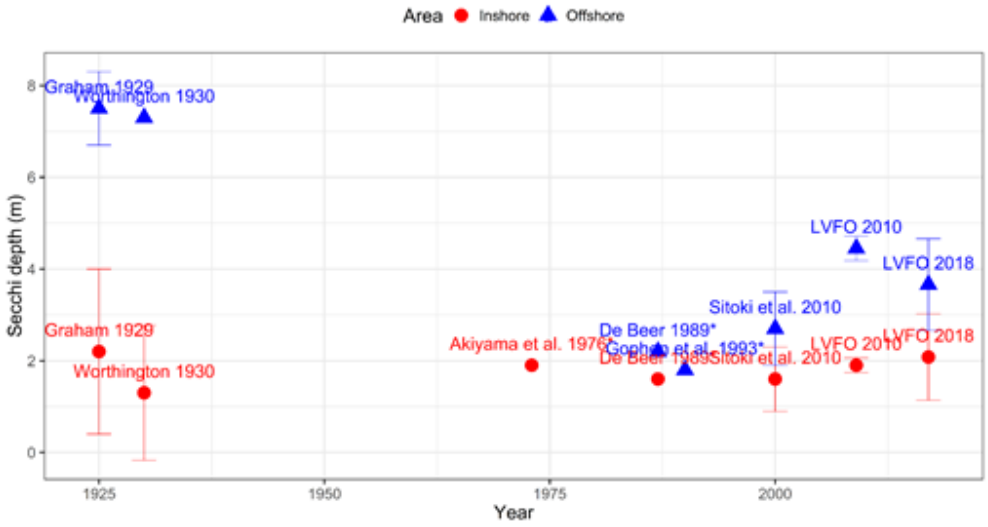


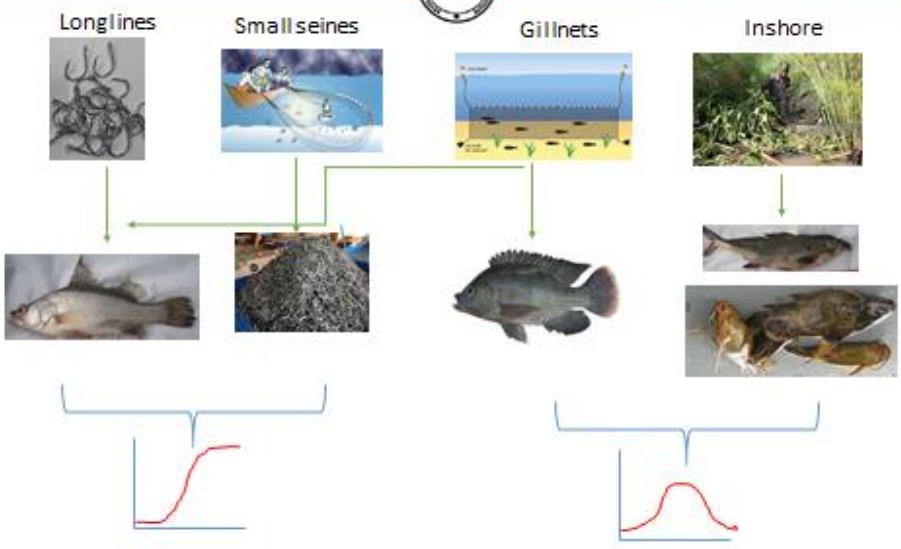
Higher concentration in inshore areas the major gulfs

Match between modeled and observes Chlorophyll a



Water transparency





Trends in stock densities also changed

- From multispecies fishery to one dominated by 4 major commercial stocks Nile perch *Lates niloticus*
  - Nile tilapia *Oreochromis niloticus*
  - Dagaa *Rastrineobola argentea*
  - Haplochromines

- Apart from Nile tilapia only estimated through trawl and catch surveys, the other 3 are estimated through trawl, acoustics, and catch

Fishery

The Original Fish Fauna


Haplochromines


Brycinus sp


Protopterus


Bagrus docmac


Schilbe intermedius


Synodontis victoriae


Rastrineobola


Barbus spp


Labeo


Oreochromis variabilis

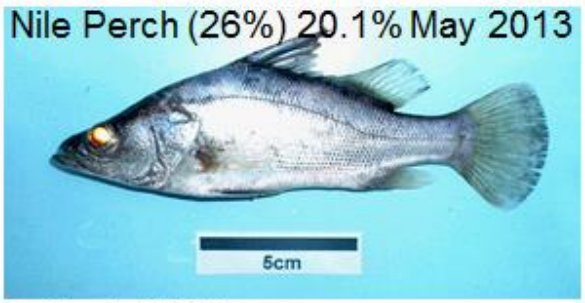

Clarias gariepinus


Mormyrus spp


Oreochromis leucostictus

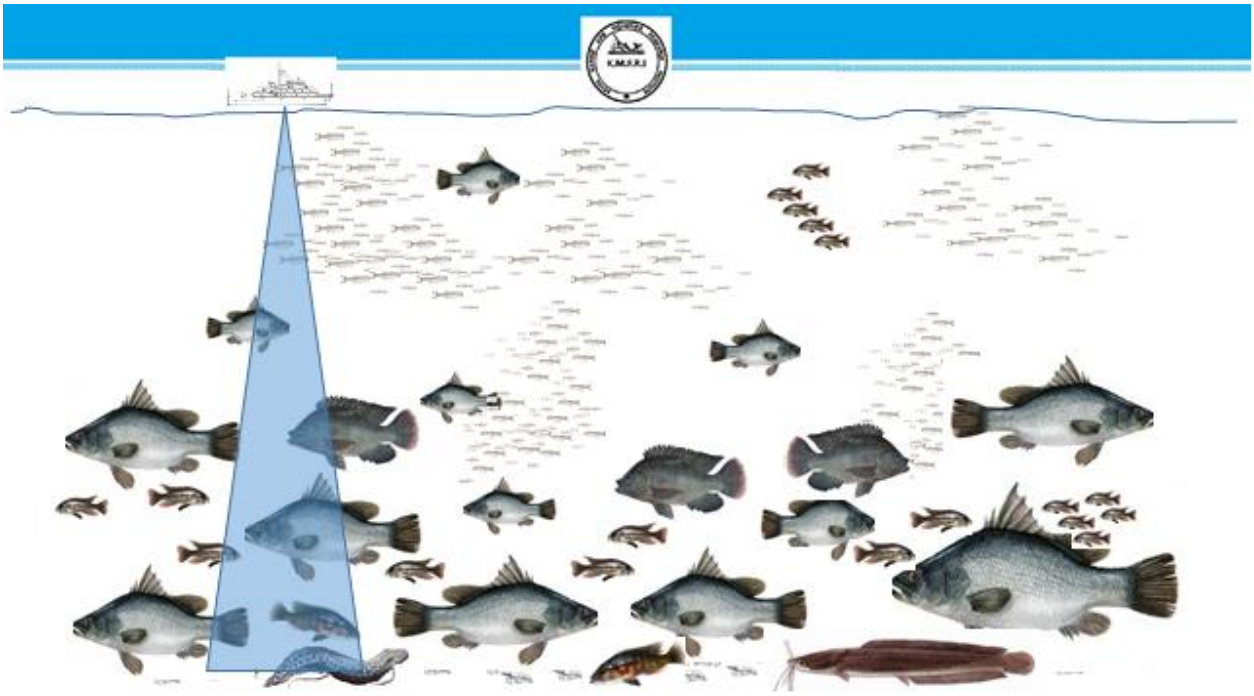
Fishery
Current fishery of Lake Victoria

Nile Perch (26%) 20.1% May 2013

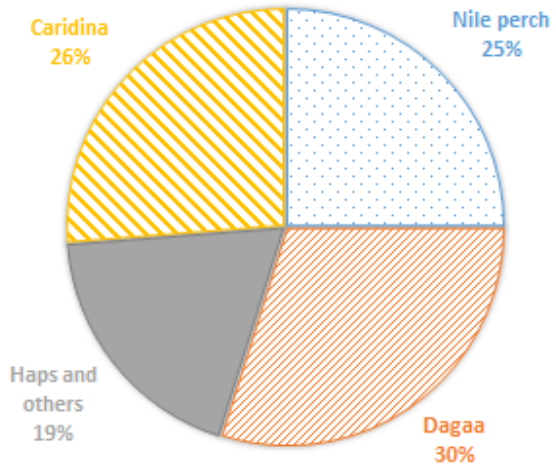


Tilapia (7 %)

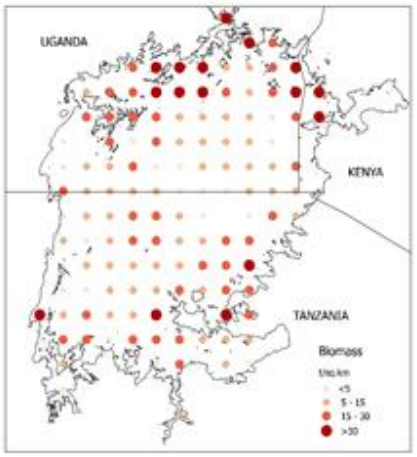
Dagaa (53%) 72.3% May 2013

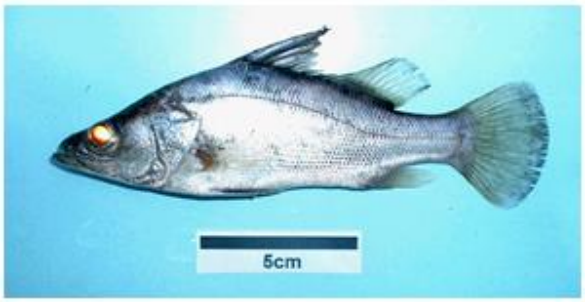


September 2018 Status

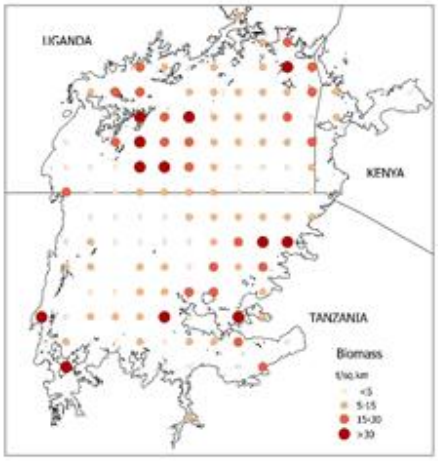


Nile perch spatial distribution

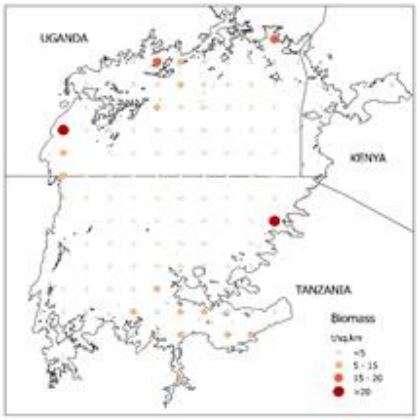




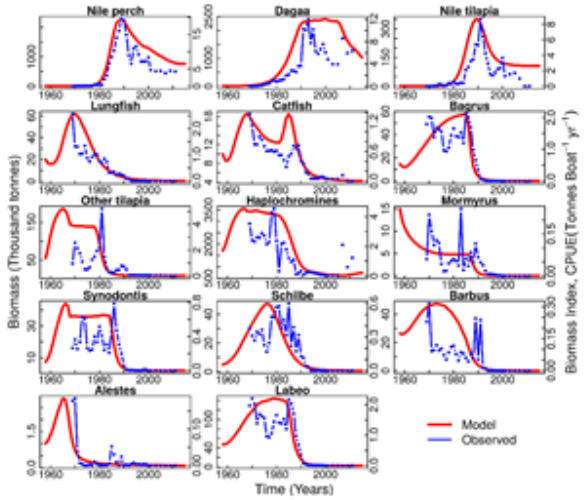
Dagaa spatial distribution



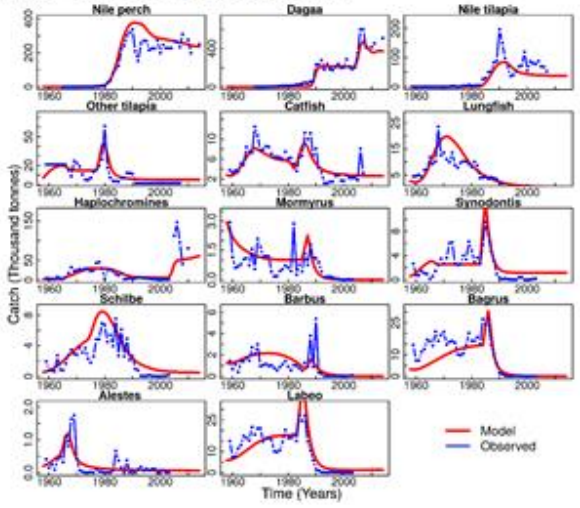
Other species spatial distribution



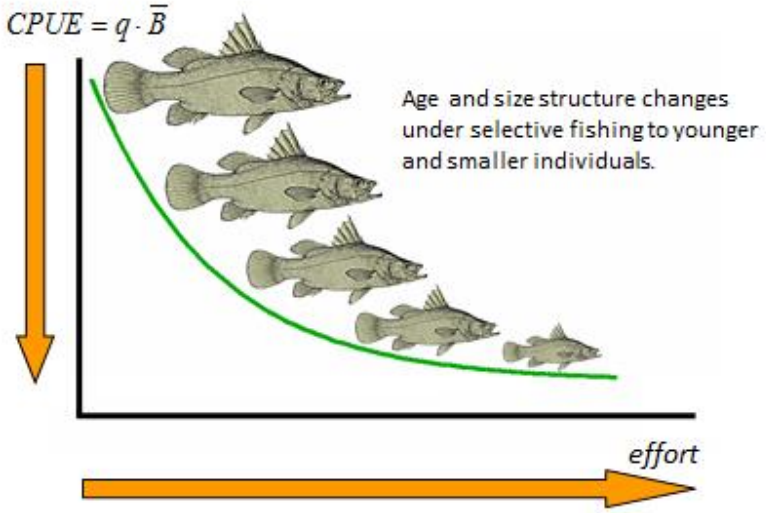
Modeled biomass and observed CPUE trends



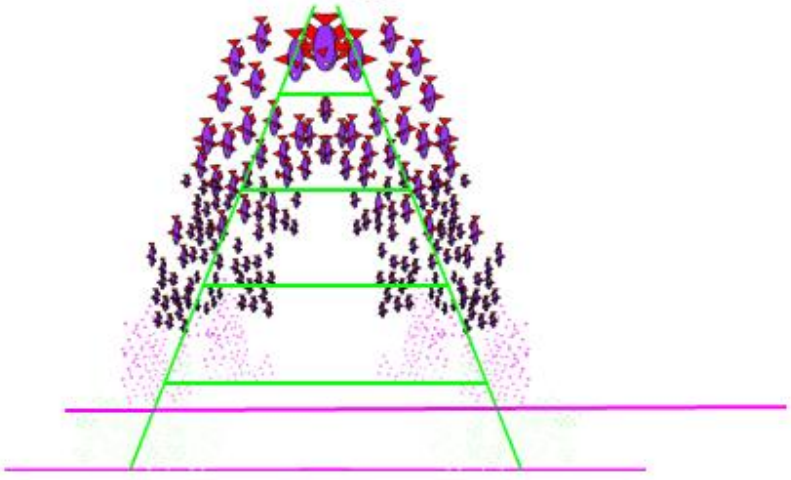
Modeled and observed catch trends



We see this as a sign of fishing



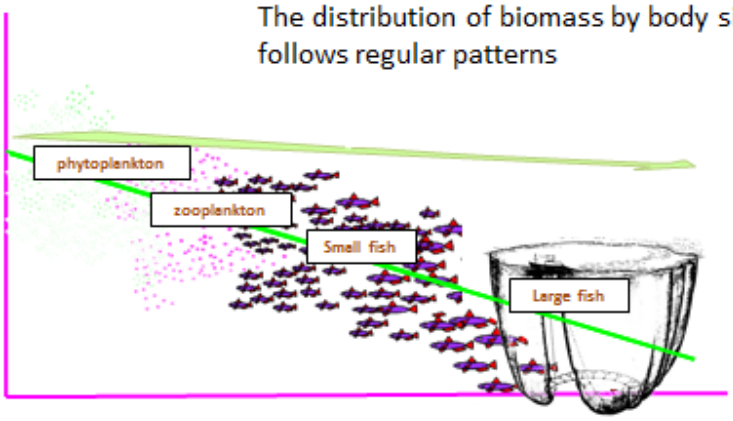
The food web is size structured…



..abundance is inversely correlated with size

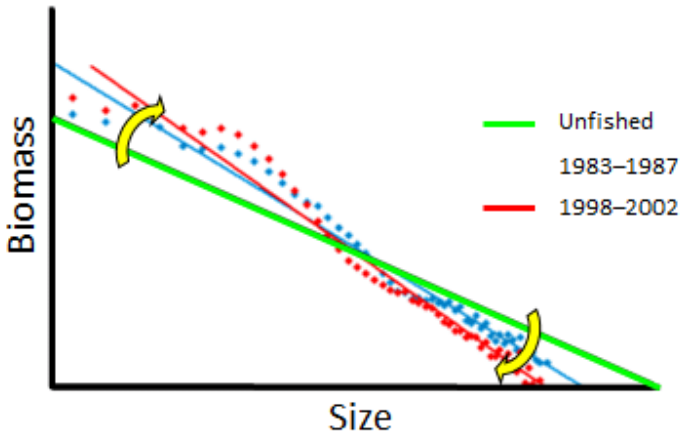
Community size spectrum

The distribution of biomass by body size follows regular patterns



Under conventional selective fishing slope and intercept will change

Changes in the Lake Victoria

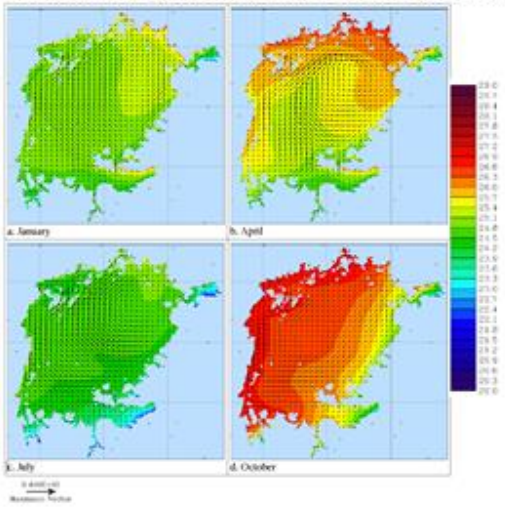


Garcia et al. 2012

Problem???

- Lake Victoria's complex ecology mixed with the multiple stresses, have LIMITED the **understanding** of the system dynamics, major processes, drivers and responses
- Ecosystem models make it possible to simulate large-scale experiments that would be economically/logistically expensive and risky to perform on a real ecosystem.

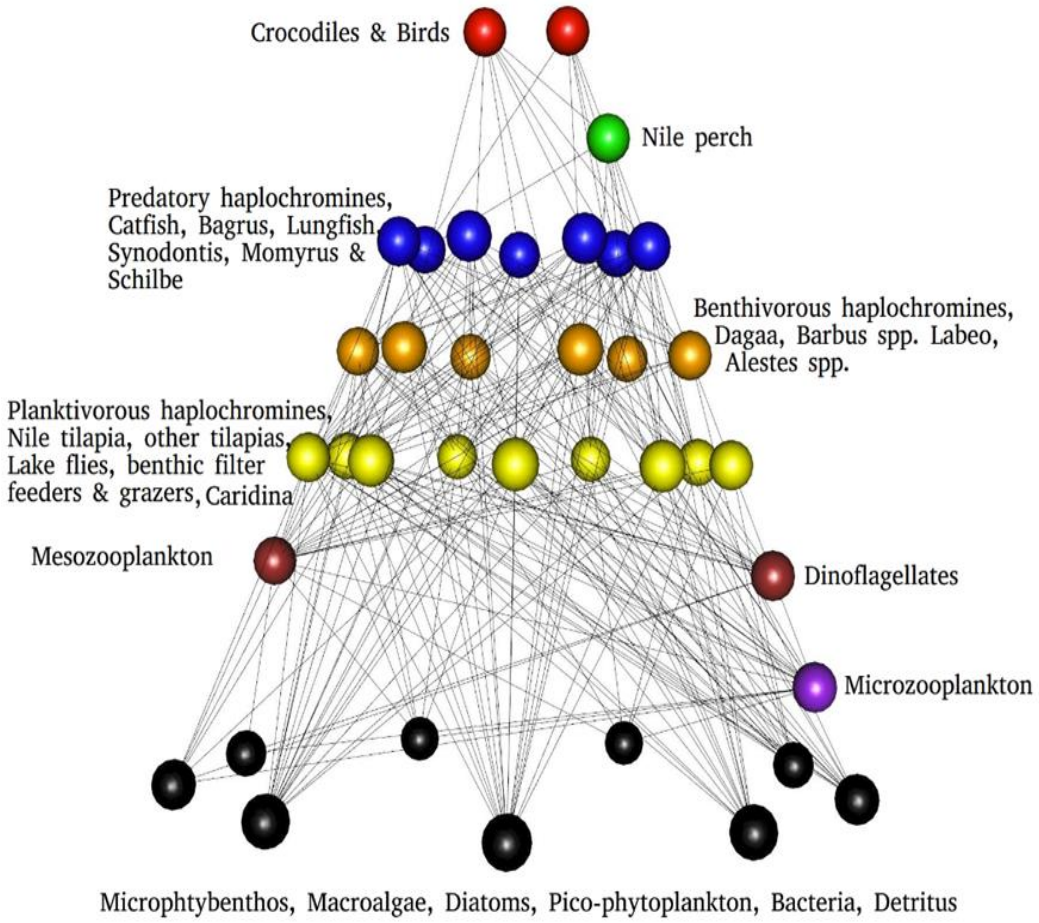
Modeled (5 m) temperature (shaded) and currents (vectors)

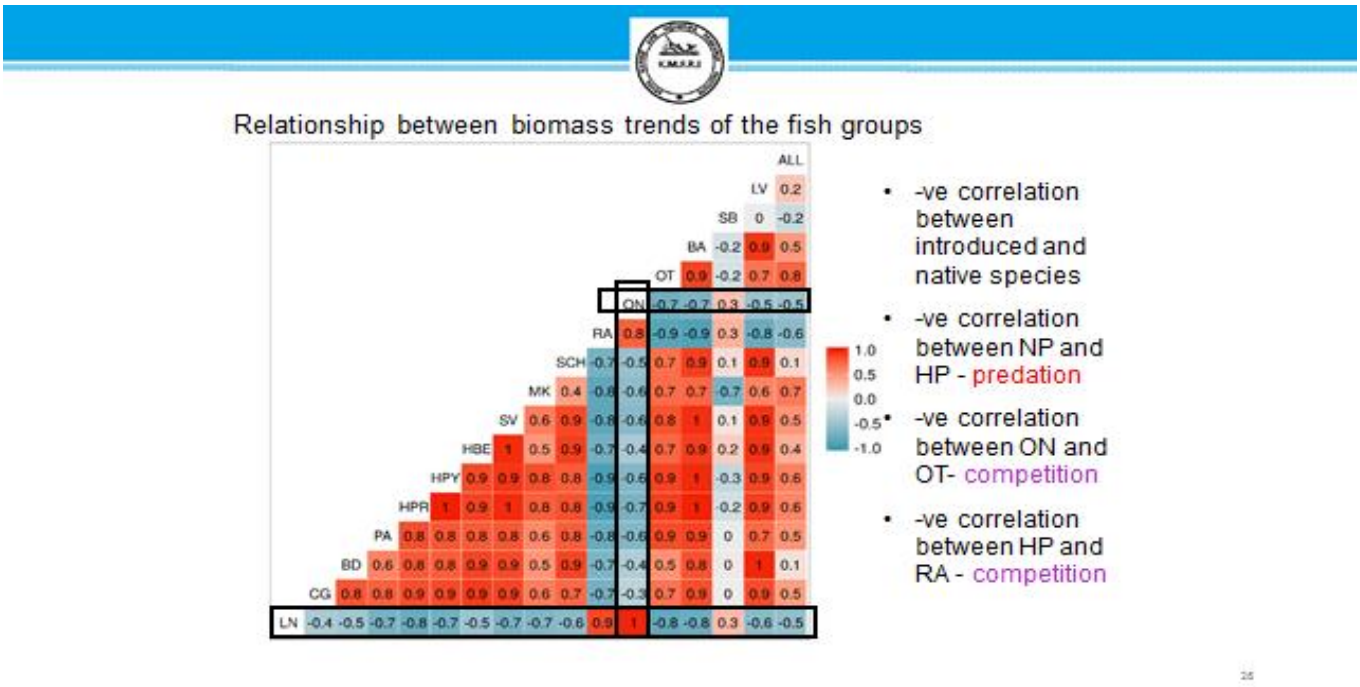


Remarks

- Surface water currents take on different patterns throughout the year
- Little exchange of water between the major gulfs and the open lake.
- Location and timing of upwelling and vertical mixing can be used to predict regions of high primary productivity and thus fishery production.

Trophic interactions in Lake Victoria



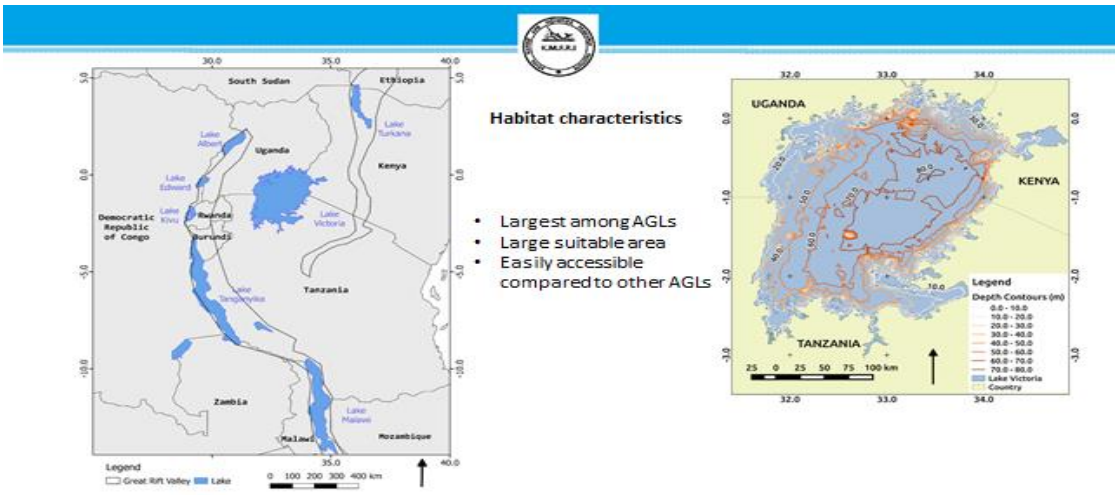


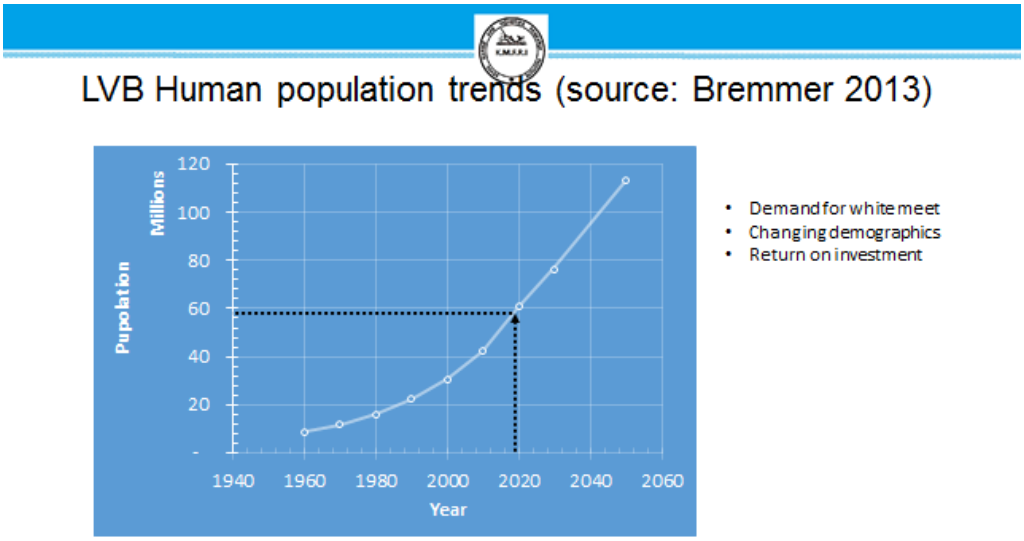
Remarks

- Model results show elevated nutrients and primary production in inshore areas and gulfs.
- The introduced Nile perch has a strong negative correlation with haplochromine species.
- The model highlights the significance of predator-prey relationships and the impact of introduced species.
- The model provides a platform for "testing" management measures before actual implementation.

Introduced species and ecological changes

- Before Nile perch introduction, the lake had more than 500 species
- Over 200 species were extirpated with the voracious predator
- Most of the remaining species abundance declined with explosion of Nile perch biomass.





REACTION(S) FROM THE PLENARY

How do we reduce pollution and water hyacinth?

How to Write a Paper and Get It Published (An Insider's View)

Paul Mireji, PhD
Yale School of Public Health, NH,CT
Editor, *PloS Neglected Tropical Diseases*
Peterpaul.mireji@yale.edu

PLOS | NEGLECTED TROPICAL DISEASES

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Rejection Letter from an Editor

Dear Sir,

Many thanks for asking whether we would like to publish your paper.

Your paper is good and original, but unfortunately we are simply not willing to publish it.

The trouble is that the good bits were not original and the original bits were not good.

Yours faithfully

Why Do Journals Reject Our Utterly Groundbreaking, Brilliant Work?

The Reason for Rejection Is Often Very Simple…..

- The paper was so poorly written and so poorly structured that the editor simply couldn't fathom its meaning
- Editors are human beings: impressed by papers that are short, easy to read, and contain **A CLEAR MESSAGE**
- What's yours?

What I'd Like to Talk About Today

- **PREPARATION:** things to think about before you even put pen to paper
- **SELLING YOURSELF:** how to capture an editor's attention
- **STRUCTURE:** without a clear structure, you (and the editor) will be lost
- **EFFECTIVE WRITING**: there are some simple rules, which can make a *huge* difference

Before You Start Writing, Ask…

- What?
- Where?
- How?

What is My Message?

- If editors cannot work out the single take home message, they will reject your paper
- They will also reject it if you haven't convinced them of your study's importance

Where Will the Paper End Up? (Audience)

- You **MUST** choose a journal and write for that journal's audience
- Make sure the journal publishes the type of study you've done
- ***What does this audience already know about this topic and what do they want to know now?***

How Will I Write It? (Style)

- **Read the journal's guidance to authors and its style guide**
- **You must make sure that you've followed guidelines for writing up specific types of studies**
  - **RCTs: CONSORT**
  - **Systematic reviews: QUOROM**
  - **Observational epi: STROBE**
  - **Studies of diagnostic accuracy: STARD**
  - **Microarray data: MIAMI**

Make sure to go the EQUATOR website before you report your study!

"The EQUATOR Network is a new initiative that seeks to improve the quality of scientific publications by promoting transparent and accurate reporting of health research."

www.equator-network.org

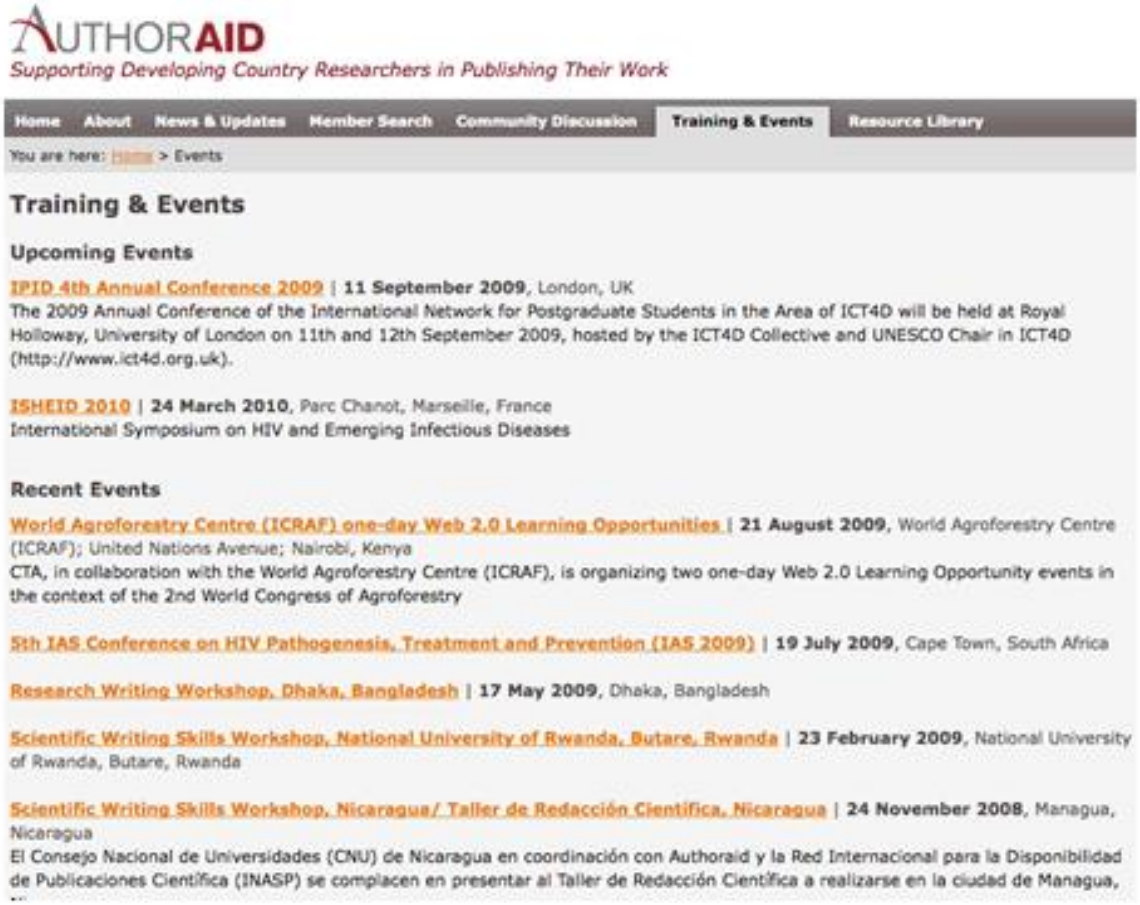
New author-aid site

- Junior scientists will get a mentor (often a retired academic) who mentors them through the writing process.

  http://www.authoraid.info/about/

- The website also has "resources" page with lectures on how to write etc.

http://www.authoraid.info/resources/



Editorial Triage

You have to "sell yourself" and at least get through triage.....

Editorial Triage:

Does this article have a clear message?
Is it original?
Is it important?
Is it true?
Is it relevant to our readers?

What Is the First Thing That an Editor Looks At?

The Cover Letter is Crucial!

- Don't waste the opportunity to "sell" your work
- Don't write something dull

("Please consider this manuscript for publication in your esteemed journal")

- Do tell the editor why they really should take your work seriously

Pre-submission inquiry

- Help you save time if you are not sure about the suitability of your research for the journal's interests.
- Evaluated based on your Abstract!

What is the Second Thing That an Editor Looks At?

The Title….Make It Compelling

Concise and informative

Contains the most important words related to the topic

Entice reader without giving away the punch line

Not overly sensationalize

Some journals now insist on design

Titles of Research Articles

Bad Title

The amazing effect of bednets on malaria

Good Title

A randomized controlled trial of efficacy of insecticide treated bednet use for malaria control

Titles of News Stories/Editorials/Commentaries

Bad Titles

Doctor in fraud case

Stress in doctors

Better Titles

Doctor convicted in $4m fraud case

Stress levels in doctors soar to a new high

GOOD PRACTICE POINT (GPP) Editorials/commentaries/news: put a verb in the title

What is the Third Thing an Editor Looks At?

The Abstract

MANY JOURNALS NOW BASE THEIR DECISIONS ON THE ABSTRACT ALONE

Sadly, many authors write the abstract in a great rush, almost as an afterthought

- Must be concise, "stand alone" piece with a very clear message.
- Must accurately reflect the full text paper

Why did you do the study? What did you do? What did you find? What did you conclude?

Structured Abstract

Background Abstract	*Glossina fuscipes fuscipes* is the major vector of human African trypanosomiasis, commonly referred to as sleeping sickness, in Uganda. In western and eastern Africa the disease has distinct clinical manifestations and is caused by two different parasites: *Trypanosoma brucei rhodesiense* and *T. b. gambiense*. Uganda is exceptional in that it harbors both parasites, which are separated by a narrow 160-km belt. This separation is puzzling considering there are no restrictions on the movement of people and animals across this region.
Methodology/Principal Findings Abstract	We investigated whether genetic heterogeneity of *G. f. fuscipes* vector populations can provide an explanation for this disjunct distribution of the *Trypanosoma* parasites. Therefore, we examined genetic structuring of *G. f. fuscipes* populations across Uganda using newly developed microsatellite markers, as well as mtDNA. Our data show that *G. f. fuscipes* populations are highly structured, with two clearly defined clusters that are separated by Lake Kyoga, located in central Uganda. Interestingly, we did not find a correlation between genetic heterogeneity and the type of *Trypanosoma* parasite transmitted.
Conclusions/Significance Abstract	This lack of a correlation between genetic structuring of *G. f. fuscipes* populations and the distribution of *T. b. gambiense* and *T. b. rhodesiense* indicates that it is unlikely that genetic heterogeneity of *G. f. fuscipes* populations explains the disjunct distribution of the parasites. These results have important epidemiological implications, suggesting that a fusion of the two disease distributions is unlikely to be prevented by an incompatibility between vector populations and parasite.

Abstract writing tips

- Many students, researchers use search engines to look for information
- In search engine terms, the title of your article is the most interesting element
- Reiterate key words or phrases from the title in your abstract
- Best to focus on a maximum of 3-4 different keyword phrases in the abstract

Structure : the most crucial thing

Readers should know, throughout the piece, where they've come from, where they are now, and where they are heading

Scientific Format

- A means of efficiently communicating scientific findings to the broad community of scientists in a uniform manner.
- Allows the paper to be read at several different levels.
- Many people skim Titles to find out what information is available on a subject. Others may read only titles and Abstracts. Those wanting to go deeper may look at the Tables and Figures in the Results, and so on.

Structure…..IMRAD

- Title page
- Abstract
- Introduction
- Materials & Methods
- Results and
- Discussion
- Acknowledgements
- References
- Tables
- Figures

- Figure Legends

Introduction

- Grab the reader, drawing them immediately to the crucial issue that your paper addresses
- Keep it short: 2-3 paragraphs
- Avoid the temptation to describe everything known on the topic: just set the scene and give the "state of the art"

Tell the reader….

- Why your research was needed
- Why did it matter to doctors, patients, policymakers or researchers
- Were there any controversies you were trying to address
- What did you do that was new/innovative

….but don't give away any results or conclusions

The last sentence or 2 of your Introduction

- Give the clear, crisp research question and how you set out to answer it:
- "There have been no calculations of the harm done to health from smoking in bars and clubs. I therefore estimated the number of deaths due to passive smoking in employees working in these venues."

In a good introduction:

- Opening sentence takes you straight to the issue
- Contains the most important details of the issue
- Contains a brief summary of the controversies and the best evidence.

- Ends in a crisp, clear research question.
- Keeps with the rules of good writing and is written using Active tense rather than passive tense.

Methods: crucial in the triage process

Extremely common for editors to reject a paper because authors used the wrong method to answer their question

Give enough detail so that a qualified reader could repeat the study

If your methods section is "thin on details," editors worry that you are hiding something

Methods- Quantitative Studies

- The editor will focus on 6 things
- Design
  - Sample
  - Intervention
  - Outcomes Measures
  - Data Analysis
  - Ethics: informed consent & IRB approval

You could walk the editor through by dividing your methods section with 6 sub-headings.

Design

State clearly the design you used.

- Observational or interventional?
- Prospective or retrospective?
- Controlled or uncontrolled?
- If controlled, was it randomized or not?
- For randomised controlled studies exactly how was the randomisation done ?
- How was the randomization done? What was the unit of randomization?

- A cohort study, cross-sectional survey, or case controlled study?

Sample

How did you chose your sample?

- How did you determine your sample size? (include the power calculation)
- How did you recruit participants?
- How did you ensure that your sample was representative of the population you wanted to study?
- What measures did you use to reduce bias in the way you chose your sample?
- What were your inclusion and exclusion criteria?

Intervention

- Describe the intervention you studied and what happened to the control group
- What measures did you take to blind participants to which group they were in?
- Could contamination of the groups have occurred?

Outcome measures

- Which outcomes did you decide to measure when you designed your study? Specify your primary and secondary outcomes.
- Did you use a validated tool to measure these?
- What steps did you use to reduce bias in the recording of outcomes?

Data analysis

What statistical methods did you use to analyze your data?

Ethical considerations

Informed consent

Institutional review board approval

In studies involving human participants, you must mention that your IRB approved your research and that participants gave their written informed consent to be entered in the trial.

Methods- Qualitative Studies

The editor will focus on 5 things.

- Was a qualitative approach appropriate?
  - Quantitative – What proportion of people in Tanzania use bednets?
  - Qualitative – What stops people from using bednets?
- How were the setting and the subjects selected?
- Have the authors been explicit about their own views on the issue being studied?
- What methods did the researcher use for collecting data—and are these described in enough detail?
- What methods did the researcher use to analyze the data—and what quality control measures were implemented?

Results: The Facts and Nothing But the Facts

- Should be ordered around primary and secondary outcomes in the same order they are listed in the methods section.
- State clearly and simply what you found, using words and numbers.
- Use tables and figures for the main number
- Don't duplicate information in text and tables.

Figures and Tables

Each figure/table: ONE STAND-ALONE MESSAGE

Don't overload them with numbers or ink

Table/Figure should be entirely understandable on its own, without looking at the whole paper or reading the text of the result section.

Results

Persuade the editor your sample was representative of the population you wanted to study.

If your response rate was low (under 60%), most journals will still consider publishing it provided that:

- There is no major reason why the responders should be different from the non-responders.
- The nature of the research question or population being studied means that a higher response rate would have been unfeasible.

Your Statistics data should let the reader know:

- How likely your results are to be true
- How confident the reader can be in your data.
- How practical your findings will be to implement

Discussion

- Don't write an expansive essay that extrapolates widely from what you found
- Start discussion with a single sentence that states your main findings, e.g.

"We showed that expression of the antimicrobial peptide Attacin in tsetse inhibits African trypanosome transmission."

Discuss *both* Strengths *and* Weaknesses

- It is tempting to just discuss how great your study is, but editors, (and readers) are usually more interested in the problems with your work.
- Every study has it's weaknesses, and it is best if you can identify them yourself as an author, rather than letting editors and readers find them

- **Relate your study to what has gone before.**
  - How do your results fit in with what is already known?
  - What are the strengths and weaknesses of your study compared to previous studies?
  - Why a different conclusi

- **Discuss what your study means**.
  - Be careful not to overdo the importance of your findings, since readers will probably make up their own minds anyway.
- **Unanswered questions**.
  - What did your research not address? Avoid using the cliché "More research is needed."

If you have written a long rambling discussion section……..

Organize the Discussion: Pyramid structure

- **First Paragraph**:
  - Interpretation/Answer based on key findings
  - Supporting evidence
- **Subsequent paragraphs**:
  - Comparison/Contrasts to previous studies
  - Strengths and weaknesses (limitations) of the study
  - Unexpected findings
  - Hypothesis or models
- **Last paragraph**:
  - Summary
  - Significance/Implication
  - Unanswered questions and future research

EXTRAS

- References (cite them accurately, restrict yourself to the key ones, check the journal's house style)
- Acknowledgements
- Contributor ship (who did what)
- Competing interests

- Funding
- Statement about ethics committee approval.*

The Rules of Writing

- Do not use long words, long sentences, passive tense or stuff several complex ideas into one sentence
- Short, simple words
- Short sentences (average 20 words; never write a sentence >50 words).
- Cut out unnecessary words (e.g. adjectives)
- ACTIVE tense ("We concluded" and not "It can be concluded that")
- Avoid jargon
- Avoid double negatives ("Malaria is not uncommon")

Clear Writing Techniques

- Signal the research question
- Keep a consistent order
- Repeat key terms
- Keep a consistent point of view
- Put parallel ideas in a parallel form
- Use topic sentences with transitions and key terms

Signal the question

- Lets the reader know explicitly what the research question being addressed is.
- Sets up an expectation for the rest of the paper/grant.
- Use explicit phrases
- Use question words - "whether" or "which"
- State the hypothesized effect
- Identify the type of variables and study design.

In which example below is the question signaled?

We were interested in the relationship between HIV and malaria.

In this study, we studied the prevalence of coinfections with HIV and malaria in Urfa.

Keep a consistent order

- **Paragraph structure**
  - Ideas must be well organized.
    - Make sure each sentence has just one idea
    - Make sure each paragraph captures just one topic
    - Make sure the first sentence of each paragraph captures the main message
  - Topic sentence followed by supporting sentences.
  - Explicit relationship must exist between sentences.
  - Explicit relationship must also exist between paragraphs and sections of papers.

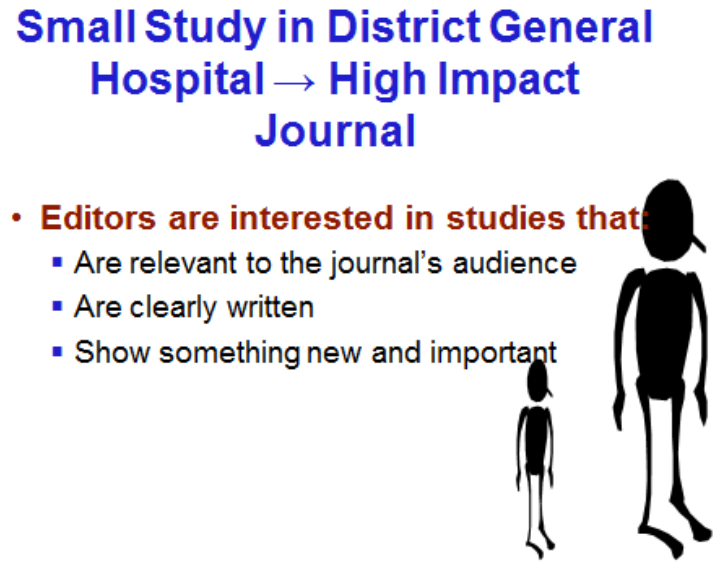
Repeat Key Terms

- Key terms are words or phrases that describe important concepts, variables, research methods, or study groups.
- Strongest technique for providing continuity.
- Links sentences, paragraphs, and sections together unmistakably.

Use Topic Sentences with Transitions and Key Terms

- Use a topic sentence at the beginning of each section.
- Use another topic sentence at the beginning of each paragraph within the section.
- Use transition words, phrases, and/or clauses that contain key terms in the topic sentences.

Some Questions for Reflection



- **To which journal should I send my paper?**
  - **This question should be decided before you write you paper, as your paper should be written with a particular journal in mind.**
  - **Reasons to pick a particular journal**

SETTING ASIDE TIME TO WRITE
Can I squeeze it in between other work?

- It can be a major challenge to find time to write.
- Most professional writers would say
  - **Set aside 20 minutes every day to write.**
  - Make writing easier by planning before you write.
    - Writing is "not a test of personal worth but a tool for achieving a particular objective. When your writing achieves what you set out to do, then you can consider it a good piece of writing and get on with your life."

[Tim Albert - Trainer in medical writing.]

Can I leave all the writing to the end?

- Love the research, but not keen on writing?

You could leave it all until the end, but it may be easier to start structuring and getting the bare bones of the paper down in writing before starting the research.

What should I start writing first ?

- Methods
- Figures
- Results
- Discussion
- Introduction
- Abstract and Title

REVIEWERS request REVISIONS NEXT STEPS……

- Fully incorporate reviewer's suggestions into a revised manuscript
- Address all reviewer concerns in your rebuttal letter sent to the editor

PAPER REJECTED!!!!!! NEXT STEPS……

If you genuinely think that your research was important, well done, well written, and deserves to reach that journal's audience, you can write an appeal letter to the editor.

DOS & DON'TS

- Be polite
- Point out why you think the journal may have missed an important study.
- Challenge each of the reasons the editor gave for rejecting your paper. Be firm and courteous.
- If necessary, re-write the paper in the view of the criticisms you received and ask the editor to take another look. .

- **DO NOT**
  - Under any circumstances at all abuse the editor!
  - Come across as aggressive or threatening!

The Bottom Line: You WILL Get Published if…..

- You picked an important research question.
- You used the right method to answer it.
- You wrote a short, clear account of the study that followed a tight structure and used effective writing to convey your message clearly.

REACTION(S) FROM THE PLENARY

- Plagiarism can now be detected because there are some software which have been devised to detect this malpractice.
- Good academic writing requires patience. One should not be in a hurry to get published. Always try to adhere to the comments given by the reviewers and the editor(s) to fine tune the document to publishable level.
- Guidance is needed to help detected credible and predatory journals.

RESEARCH AND INNOVATION INFRASTRUCTURE

By Prof. George Mark

What infrastructure

- Physical and Biological Sciences
- Applied Sciences
- Social Sciences
- Humanities and Education

Laboratories:

  - Students use
  - Specialized use
  - Project/Researcher specific
  - Facility sharing
- Data collection
- Data management
- Data/Information sharing

Policy and Regulatory Framework

- Act of parliament:
  - ST&I
  - Research Funding (national and institutional)
- Access and Control
  - Co-funding and Fund Raising
  - Lead researcher
  - Co researchers (Triple Helix)

REACTION(S) FROM THE PLENARY

- When we talk research many a times we think it's only in the hard sciences. Social scientists should work hard also to stamp their authority in research within their areas of specialization.

- Maseno University repository is available on the university website. Those who are interested in accessing the repository should visit the website.

- We normally have too much talk and extremely minimal credible action. We should invest more in action and talk less.

AGRICULTURE PRODUCTION IN LAKE VICTORIA BASIN: GROWTH, CHALLENGES AND FUTURE PROSPECTS

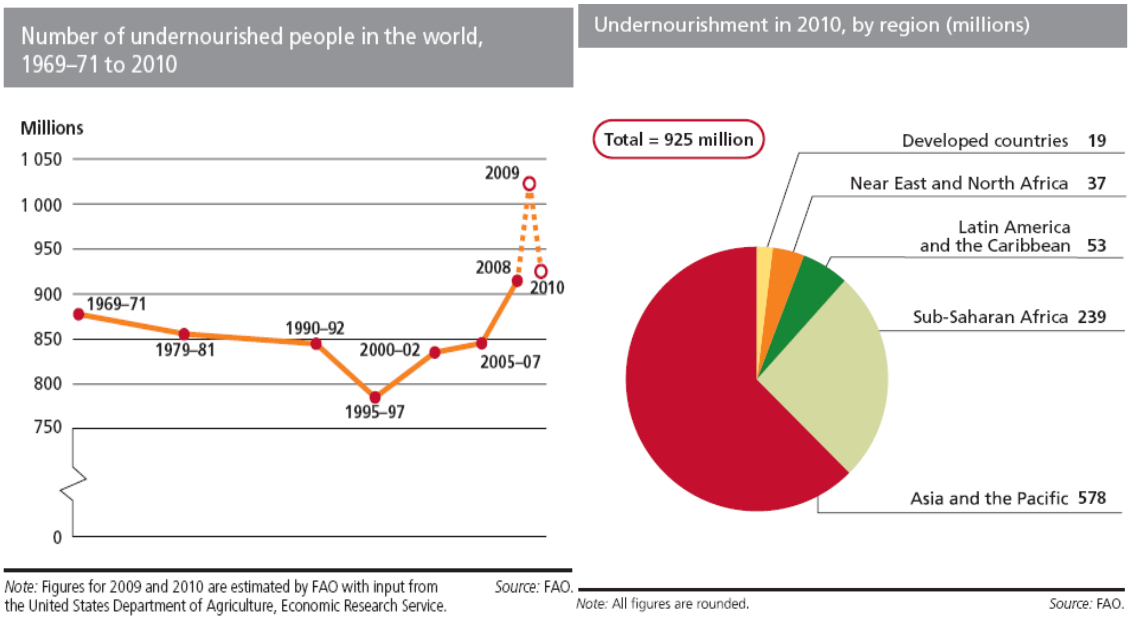
By Prof. Joshua O. Ogendo, PhD

Director, Crop Management Research Training
And Associate Professor of Crop Protection, Egerton University, Kenya
Email: jogendo@egerton.ac.ke

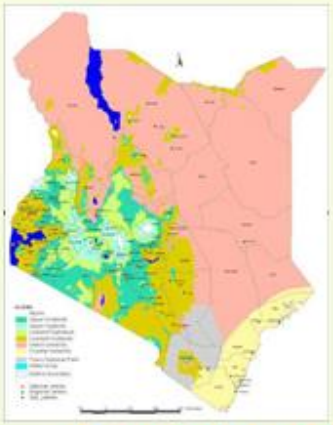
Format of Presentation

1. **INTRODUCTION (OUTLOOK- Africa & Kenya)**
2. **AGRICULTURE: GROWTH AND CHALLENGES (1960s- NOW)**
   a) **20th Century Experiences**
   b) **21st Century Growth Trajectory**
3. **R & D INTERVENTIONS/PROSPECTS**
4. **MY ON-GOING PROJECTS**

925 Million people are Undernourished (WORLD) & out of this, about **30% (over 250 million)** are in Africa

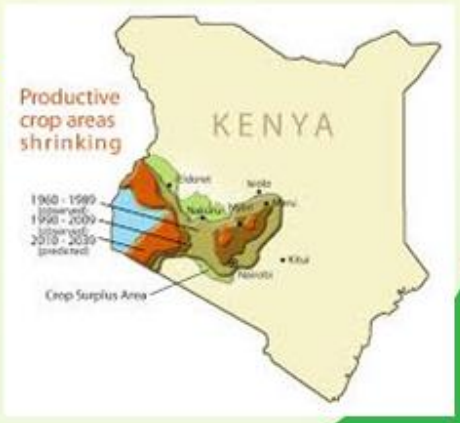


a) AEZs of Kenya



b) Mapping ASALs

c)Arable lands-Kenya(20%)



Agriculture is the art and business of cultivating soil, producing crops, raising livestock & fishing

Maseno University, June 7, 2019

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Left: LVB-East Africa;

Right: LV Region Economic Block (13 counties)

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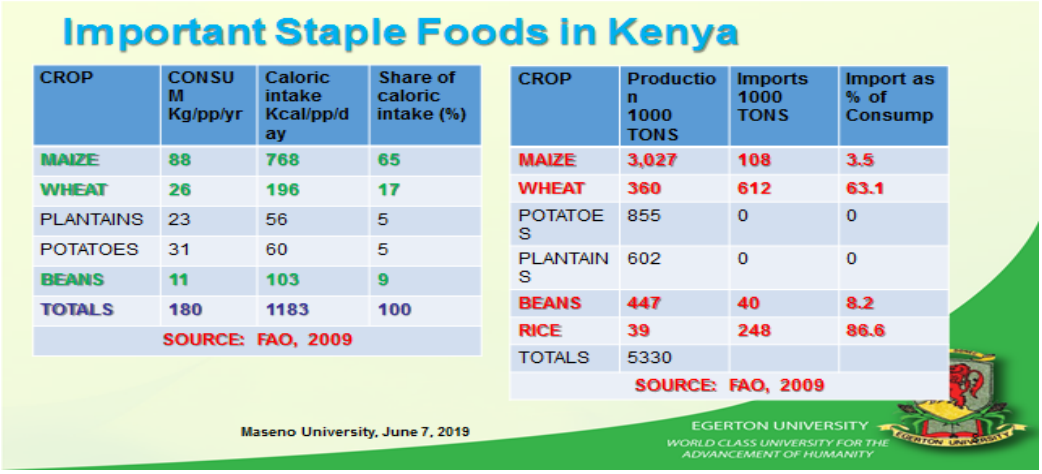
Introduction

- Agriculture's bedrock of Kenya's Development- contributes **27% of GDP , employs 75% workforce & constitutes 40% of export earnings**.
- Agriculture sector comprises 4 sub-sectors: **Food Crops, Industrial Crops, Horticulture, & Livestock and Fisheries**
- Food crops constitute **32% of agricultural GDP (Maize: 15%)**
- Agricultural Production in Kenya & LVB greatly influenced by **seasons, variable weather & farm sizes;**
- For significant growth to be achieved, agriculture sector must be modernized
- Once transformed, agriculture sector expected to contribute to GDP (HH incomes), create jobs and Food & Nutrition Security
- The importance of Agriculture in Kenya has been exemplified over time thro' Sessional Papers, ASDP, Vision 2030, Big Four Agenda (2017-2022) and ASTGS (2019-2029).
- The ASTGS prioritizes three anchors:
  - ❖ Increased smallholder farmer incomes
  - ❖ Increased agricultural output & value addition
  - ❖ Increased HH food resilience
- Food and commodity value chain: farmer and other actors

Important Staple Foods in Kenya



Mean share of HH income spent on food in SSA

ENTERPRISE	PERCENT OF TOTAL INCOME		
	1994-1996	2001-2002	2003-2004
CROP PRODUCTION (OF WHICH)	70.6	69.1	72.5
GRAINS	**37.3**	**38.3**	**35.1**
ROOTS AND TUBERS	**13.2**	**14.2**	**17.7**
BEANS & OILSEEDS	**7.3**	**8.3**	**9.6**
NONFOOD CASH CROPS	2.0	2.4	5.5
FRUIT & VEGETABLES	5.0	5.9	4.6
OTHER CROPS	5.2	-	0.1
ANIMAL PRODUCTS	3.4	2.8	5.1
OFF-FARM ACTIVITIES	26.0	27.7	21.7

SOURCE: FAOSTAT, JAYNE ET AL., 2001

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AGRICULTURAL PRACTICES IN LVB-KENYA (Historical Perspective & Current Status)

Africa in the 20th Century

- During the 1950s to early 1960s: Most Africa countries were at par with countries in Asia and Latin America w.r.t. economic development
- Yet Africa's growth performance has been disappointing (**often described as a tragedy**!!)
- Agriculture, esp. extension, was fully funded by Governments
- Dominated by Large & medium farms (exclusion of smallholders who constitute >70%)
- Increase in land fragmentation & Reduction in communal land
- High bank rates…high rate of defaulting!
- Growth in demand for fresh high value crops in urban

Thereafter:

1. Witnessed extensive economic & financial sector reforms over the past 2-3 decades which incl. Large scale privatization programs

2. Embraced measures to empower private entrepreneurship & capital market development

3. Emergence of stock markets in SSA including regional markets / economic blocks

Agriculture Production 1963-1980s: Features and Drivers

- ❖ Largely characterized by shifting cultivation/opening up new lands (fertile; no need for fertilizers);
- ❖ Domestication and Introduction of new varieties and animal breeds
- ❖ Increased agricultural production witnessed resulting from more acreage, high yields & GCHPs/GAHPs;
- ❖ Functional government agriculture extension service
- ❖ Controlled farm input prices
- ❖ Agricultural GDP was quite impressive (≈40% by 1990) ….however absolute contribution of agriculture sector increased
- ❖ Large labour force against comparatively low yields

<u>The 21st Century witnessed</u>:

- ✓ Commodity productivity growth
- ✓ Increased % HHs using fertilizer inputs (although fertilizer application rates in maize remained largely constant)
- ✓ Increased adoption of high yielding crop varieties/improved animal breeds
- ✓ Increased density farm input distributors
- ✓ Per capita landholding and per capita cultivated land **has been declining** owing to intensifying population pressure & continued land fragmentation
- ✓ Over 30% of smallholder farmers control **<u>less than 1 acre of land</u>**

- ✓ Although generally agreed that Agric. Productivity in Kenya (LVB included) is rising, the **ever-rising land pressures** in more densely populated areas is **major threat to future food security and rural livelihoods.**
- ✓ Climate variability/ change becomes a reality..hence need for intensive agriculture.

HH economic loss (Ksh) per food crop in parts of LVB-Kenya due to crop failure [Gichere *et al.* 2013. JETEMS 4(1): 31-41]

District	Maize	Beans	Sorg	Millet	G-gram	Gnut	Rice
Nyando	9,599.00	8,784.00	13,396.00	29,308.00	44,822.00	48,222.00	52,626.00
Bondo	11,803.00	7,625.00	11,525.00	58,407.00	6,698.00	-	-
Bomet	15,254.00	14,701.00	-	9,175.00	-	-	-
Budalangi	15,283.00	10,065.00	13,134.00	10,434.00	-	10,152.00	-
Kisii Cent.	6,902.00	6,649.00	17,288.00	10,434.00	-	16,446.00	-
Rarieda	18,792.00	6,649.00	12,386.00	13,579.00	21,786.00	38,578.00	-
Mean	**12,939.00**	**9,079.00**	**11,288.00**	**21,889.00**	**24,435.00**	**28,349.00**	**????**

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Period:1960-1990s

GRAIN STORAGE STRUCTURES & CONTAINERS

a) Small (60%) b) Medium (30%) c) Large (10%) scale, e.g. NCPB







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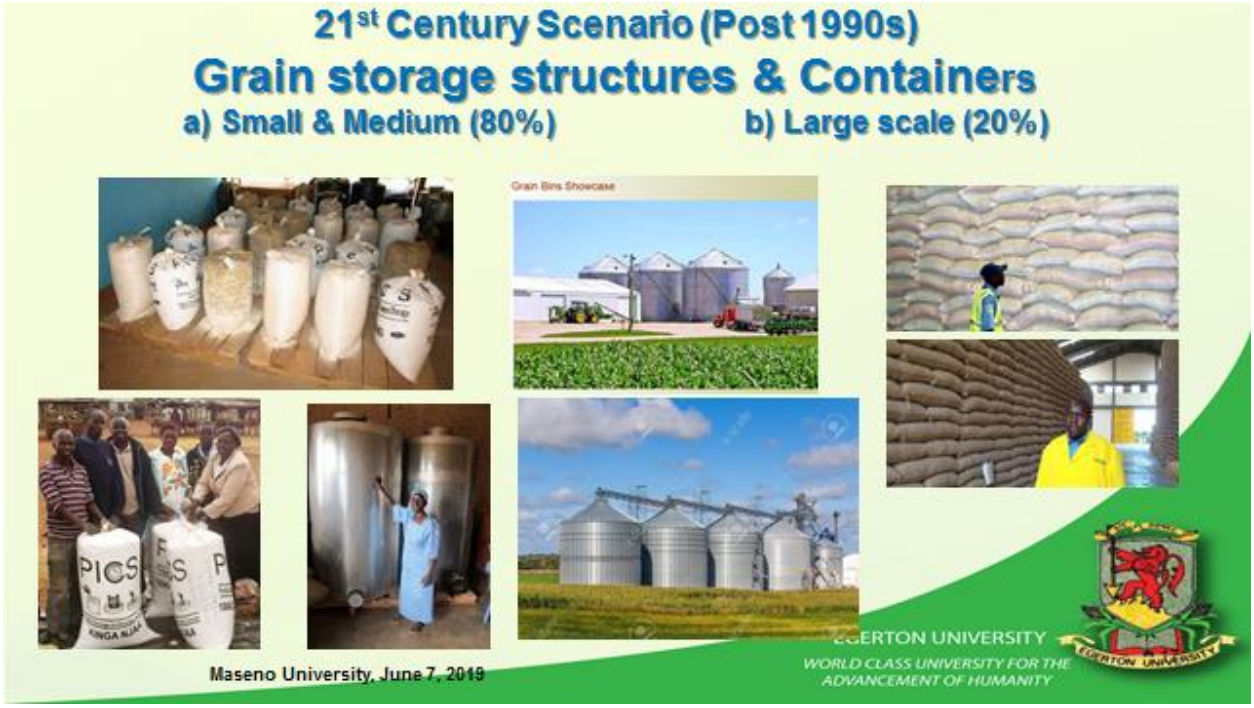


FUTURE INTERVENTIONS / PROSPECTS
(SCIENTIFIC, BUSINESS & POLICY)

R & D INTERVENTIONS

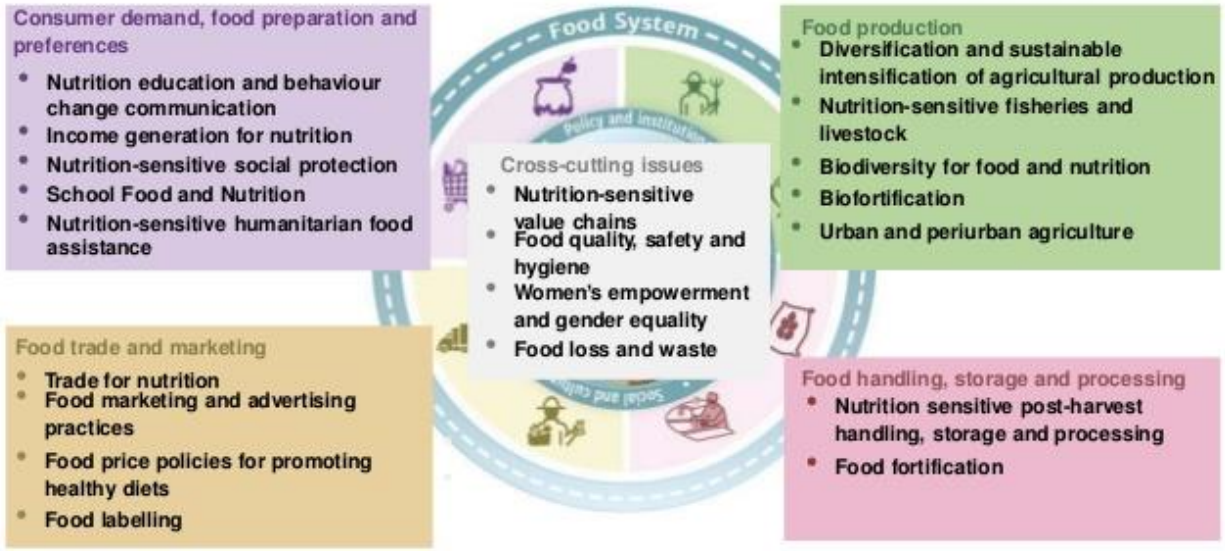
This effort should recognize & focus on:

1) **<u>Nutrition-Sensitive Agriculture</u>** for a Healthy & Productive Population…. design agriculture activities
to improve nutrition;

   - If ignored, Malnutrition results in 45% of child deaths are due to undernutrition; Lower IQ and school performance; and Reduced work productivity / earnings
   - Clearly recognize Agriculture as Source of Food

**Consider exploiting edible insects (JOOUST)

Nutrition-sensitive food systems: Option for interventions



Interventions are organized according to the **functions of the food system and as cross-cutting issues**. However, many of them relate to **several functions.**

Agriculture as a Source of Food

- Decisions on what to produce influenced by:
  - Market prices
  - Relative costs/risks
  - Productive assets
  - Preferences
  - Cultural norms
- The ability to effectively process & store food affects:
  - Shelf-life and safety of the food
  - Nutrient content
  - Access to food during lean times (food security)

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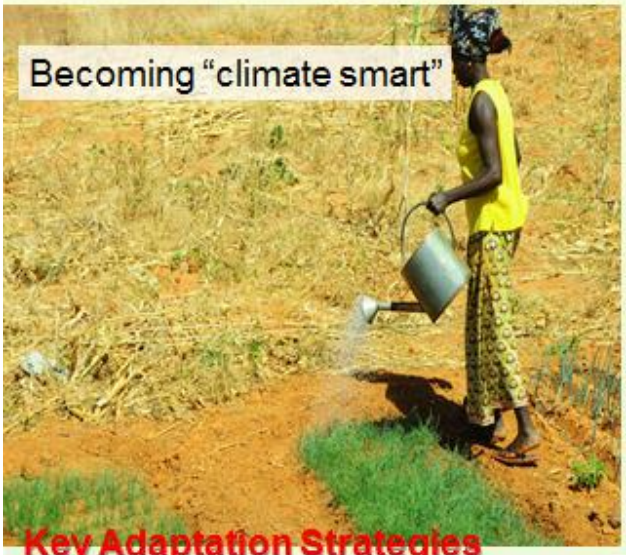
2. Value of fragile ecologies & CSA Technologies



Key Adaptation Strategies

- **Incremental Adaptation to progressive CC**
  - Closing yield gaps thro' sustainable intensification)
  - Raising the bar – technologies & policies for 2030s
- **Climate Risk Management**
  - Technologies (e.g. flood control)
  - Institutions (e.g. index-based insurance)
  - Climate info systems (e.g. seasonal forecasts)
- **Transformative Adaptation**
  - Changing production systems
  - Changing livelihood portfolios

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Technologies for Adapting (Example for West Africa)

Adaptation Technologies	Number of Households	%	Average no of years practiced
Mixed cropping	33	53	25
Early planting	24	39	15
Wetland farming	43	69	19
Early maturing/ drought resistant crops	18	29	8
Increased spacing of crops	22	35	10
Change in crop type	9	15	15
Increase in farm size	19	31	17
Agro-pastoralism	8	13	19
Weather forecasts/outlook	23	69	12
Farm implements	41	66	19
Water exploitation methods	21	34	12
Water storage methods	18	29	17
Food storage methods	8	13	11
Herd Management	22	35	18

Climate change impacts on smallholder agriculture:

Pose major threats to Nutrition, Welfare, Incomes & Health among poorer households

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3. Targeted R & D in respond to Emerging Pests, Diseases & Weeds

Cuscuta species

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4. Efforts to Reduce Post-harvest Losses

(a) Community capacity building on improved grain storage, handling & hygiene.

ADAPPT Training for a Community group

Targeted capacity building of farmers including providing basic equipment such as grain moisture testers, tarpaulins, hand shellers & protective clothing

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(b) Promote new grain storage structures & Technologies

These protect stored food grains against insect pests, rodents, birds and fungi

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(c) Community grain banks (warehouse receipt systems)

Private off-farm storage including farmer cooperative societies and where feasible, Warehouse Receipt Systems/ community grain banks, gives hope for quality grain storage, handling and hygiene and also economic empowerment of farming communities

****Investment in localized (community) grain storage structures/systems**

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(d) Promotion of "Systems Approach" to link on-farm activities with other operations within the food & commodity value chains

- This should be nested within the prevailing socioeconomic, business and political environments
- Consider **Variety, Harvesters, Dryers, Threshers, Storage Facility & Bagging** Technologies as critical for the success the target value chains (Smallholder Agriculture].

(e) As a matter of priority, PHL reduction programs should focus on:

a) Farm-level interventions with " market-oriented approach" and "linking farmers with markets". This should be backed by appropriate technical training on quality PH Mgt, business management and entrepreneurial skills.

b) Commodity Value Chains Approach….Demand for better quality grains by specific market / consumer segments

c) Integrating agricultural research and extension services to provide quality technical advice and affordable solutions to farmers and other value chain actors.

d) For smallholder farmers, with limited options to invest in improved PH practices and technologies, focus on basic storage hygiene and good storage management.

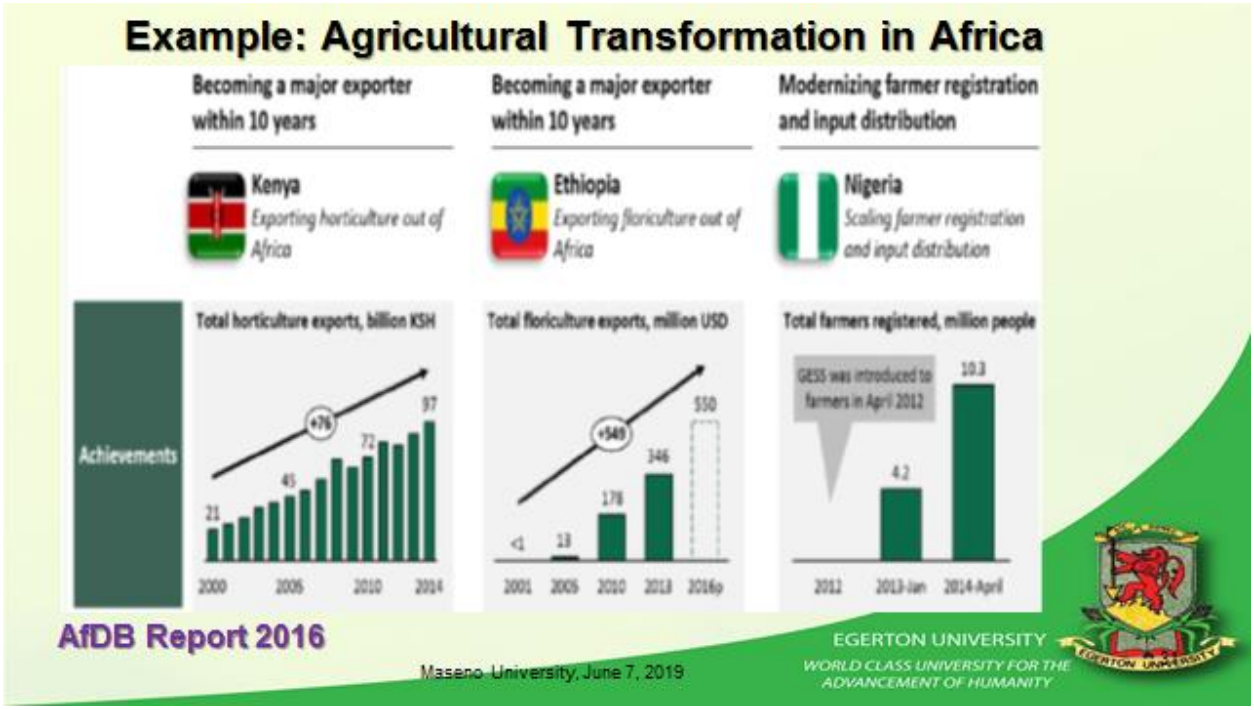
e) Research Investments on cost-effective technologies and viable business models to support adoption, e.g.- Alternatives to chemical insecticides during grain storage

- cost-effective dryers to minimize PHL of food grains
- Hermetic storage using plastic sacks

Use the Agricultural Transformation Strategy (ASTGS) as vehicle for economic empowerment:

- ✓ **Modernize** the smallholder agricultural production
- ✓ Spur economic development through appropriate innovations & value addition incl. quality postharvest handling & storage;
- ✓ Almost all smallholder farmers have challenges in **price transmission** due to many exploitative middle-traders;
- ✓ The only alternative is Transforming the agricultural value chain (AVC) to add value to own products & access higher prices;

- ✓ Due to high demand for nutrition sensitive agriculture, demand for traditional indigenous crops such as Sorghum, Millet, Vegetables is growing;
- ✓ This is untapped market / untapped area, require investment in Research and Innovation.



Future Investment Opportunities in LVB Region

Kulindwa (2004)-Agricultural characteristics of LVB, East Africa

	Catchment land area (1000 ha)		
	Cultivated	Noncultivated	Total
Kenya	1470	3400	4870
Uganda	1400	2100	3500
Tanzania	1500	5540	7040
Rwanda	930	1130	2060
Burundi	670	640	1310
Total	5970	12 810	18 780

Kenya: Only 30% land area was under cultivation

Irrigated Agriculture is Possible

- **LV Economic Block** has 7 Rivers: Sio, Nzoia, Yala, Nyando, Sondu Miriu, Mogusi, and Migori.
- High Value Crops: Horticultural (Tomatoes, Onions, Fruits)
- Opportunity for Intensive Livestock farming
- Efforts by Government: Oluch- Kimira irrigation in Homa Bay County
- Counties bordering the Lake can invest in cage fish farming
- Irrigation method dependent upon scale of operation. For example, small-scale, adopt Drip Irrigation system

Go for Local Solutions: Case of Kentainers, Nairobi, Fertigation & Biogas Systems

Integrated System: Zero grazing Unit, Maize farm, Biodigester, Water& Drip Irrigation

Value chains /Products: **Dairy, Maize, biogas, bio-fertilizer, animal feed**

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LV ECONOMIC BLOCK: HUGE MARKET/BUSINESS

COUNTY	POPULATION (2014)	Land Area (KM^2)
SIAYA	941,724	2,530
KISUMU	1,083,268	2,086
HOMA BAY	1,077,554	3,183 (1,227)
MIGORI	1,025,422	2,596
BUSIA	812,036	1,695
KISII	1,288,290	1,318
NYAMIRA	668,863	899
BOMET	861,397	2,510
KERICHO	887,659	2,441
VIHIGA	605,379	531
KAKAMEGA	1,812,330	3,051
BUNGOMA	1,500,990	3,032
TRANS NZOAI	966,167	2,500
TOTAL	13,531,079	28,372 (2.8 M Ha)

- Huge land for agric production (2.8 M Ha)
- Massive human pop. (13.5 Million) as domestic market
- Vast water resources (7 rivers) that can be exploited for irrigated agriculture

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Rainfed Agriculture in LVB Kenya

High potential zones:

- High value crops: Sweet potatoes, Horticultural (Vegetables, Onions, Tomatoes), Banana, Fruits

- Improved/high value livestock

Marginal zones: Adopt CSA Solutions

- Climate Resilient crops: Sorghum, cassava, millets, cotton, chickpea,

- Resilient livestock breeds

7 action points for Africa's agricultural R&D (DG, ICIPE; 2019):

1) Make 'risky' choices
2) Move beyond the rhetoric
3) Unpack the Agricultural Value Chain
4) Politics & policies of agriculture must change
5) Diversify agricultural research
6) Stem brain drain (external & internal)
7) Lessons from Brazil, China & Russia.

In Conclusion:

1. Agriculture will continue being major driver of economic Development in the LVB
2. Agriculture has grown from full support by Government to current status with minimal support
3. Embracing new R & D solutions, including CSA key to successful Agriculture Sector Development
4. Important to recognize and address emerging pests, diseases and invasive plant species
5. The LV Economic Block should urgently embark on available investment opportunities to spur growth
6. The 7 actions points for agricultural R & D useful moving forward
7. As part of the Big 4 Agenda: Focus on Value added products

My On-going Research, Outreach & Consultancy Projects

1. Program Coordinator,EgU (KE)-Bowie SU(USA) students exchange program (June-July 2019). Budget at Egerton: USD 29,000.00

2. Natural Pest Regulation on Orphan Crop Legumes In Africa (NaPROCLA). NRI-UK, EgU-Kenya, NM-AIST-TZ & LUANAR-Malawi. BBSRC-SASSA-GCRF; Sponsors 3 MSc & 1 PhD students. Budget for EgU: €125,040 for 3 years (2018-2021);

3. A New Technique for Locust Mass Culture for Food and Feeds Industry in East Africa. EgU (Lead), SAGLA Parks, ICIPE; Partners: Makerere-Uganda, Univ. Rwanda & SUA-TZ (Oct. 2018-Sept. 2019); USD 80,000.00

4. Consultancy "Feasibility study on Commercialization of Aloe in Baringo County, Kenya". (June-Aug 2019). Team Leader-

   Prof. J O Ogendo; Budget: Ksh. 2.8 Million

5. **Cassava Value Chain Upgrading for secure food, nutrition, income and resilience of smallholder farmers in the ASALs of Nakuru County**. Patners: Rongo University, Mtakatifu Clara (CBO), KALRO, Baraka (TVET) and EABL; (2017-2020); The MasterCard Foundation /RUFORUM. $200K for 3 yrs

6. Sub-Grantee "Impacting on productivity and livelihoods of smallholder households through **Sustainable Intensification Of Conservation Agriculture Based Maize-legume Systems** in western Kenya". (2016-2018); CIMMYT SIMLESA/Australian Center for Int. Agric Research (ACIAR). AUD 78,000.

Acknowledgements

1. Egerton University (CESAAM)

2. Development Partners: BBSRC-GCRF, EASTECO, MCF, RUFORUM & ACIAR

3. Organizers of this Conference

4. The Wonderful AUDIENCE Today!

REACTION(S) FROM THE PLENARY

- The regional block which comprises of the 14 counties around the greater lake region if the resources are well harnessed and exploited to benefit the populations within this regions will be a blessing because the well being of the populace will be enhanced.

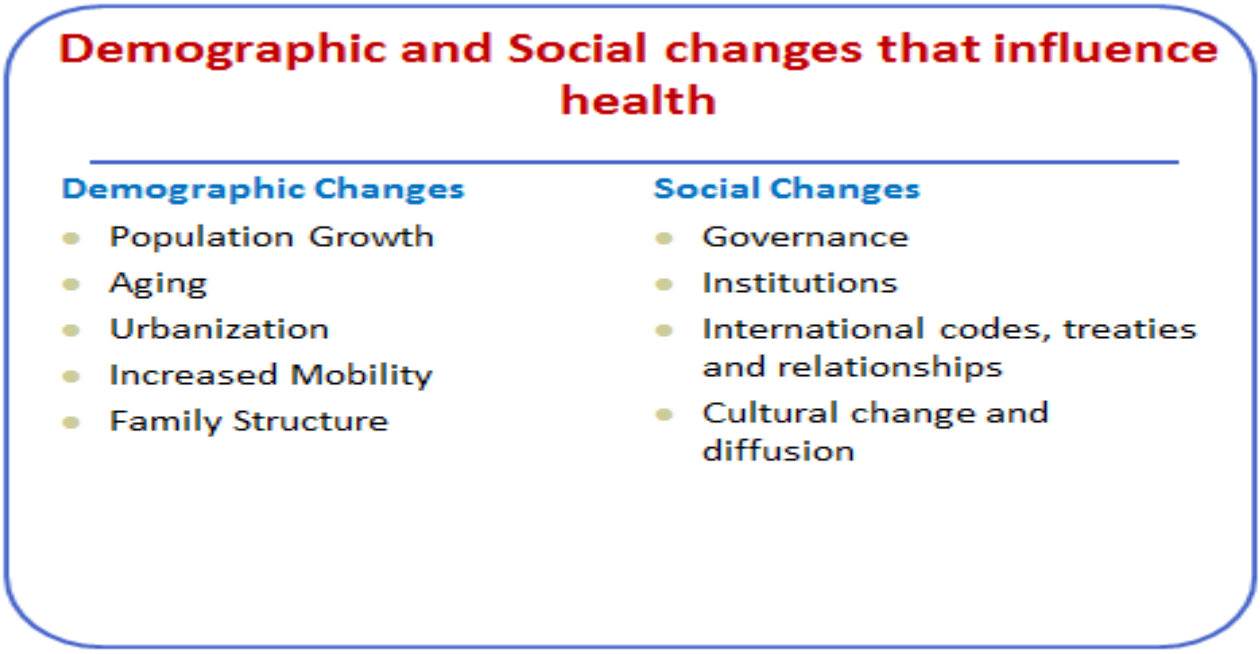
- Nutrition sensitive agriculture is good and should be encouraged in the current agricultural production units within the country. This will be a good extension from the plough to the plate.

EMERGING HUMAN HEALTH CHALLENGES IN THE LAKE VICTORIA BASIN

By Collins Ouma, PhD
Professor of Biomedical Sciences

Human Health Challenges

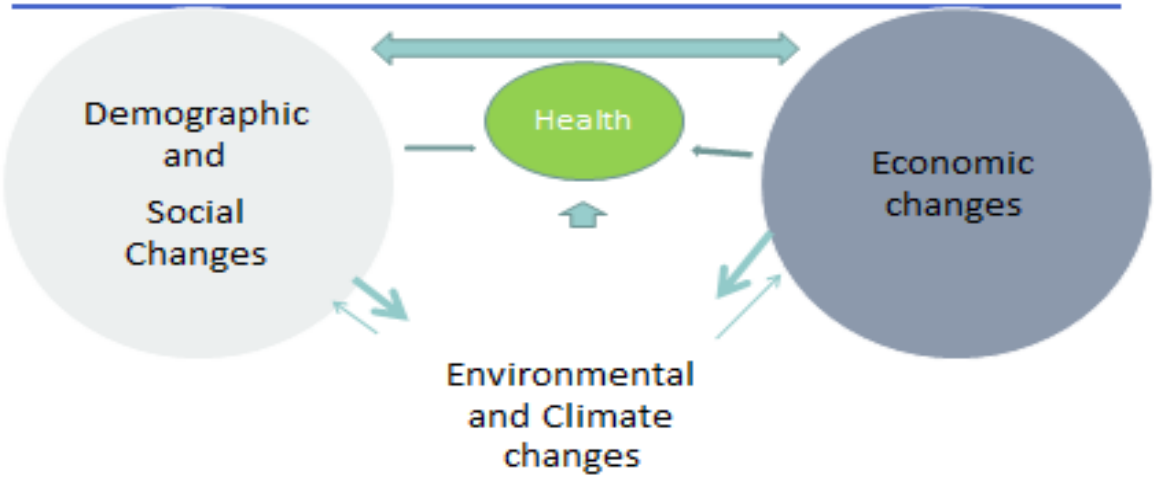
- Challenges are interdependent: an improvement in one makes it easier to address others; deterioration in one makes it harder to address others.
- Challenges are transnational in nature and trans-institutional in solution.
    - Cannot be addressed by any government or institution acting alone.
    - Need collaborative action among governments, international organizations, corporations, universities, NGOs, and creative individuals.



Environmental influences on Health

- Land and water resources
    - Use, degradation and depletion
- Energy security and use
- Ecosystem disturbances
- Climate change
    - Extreme weather conditions
    - Warming

Global Influences on Health



Adapted from McMichael AJ. N Engl J Med 2013;368:1336-1343

Fisheries

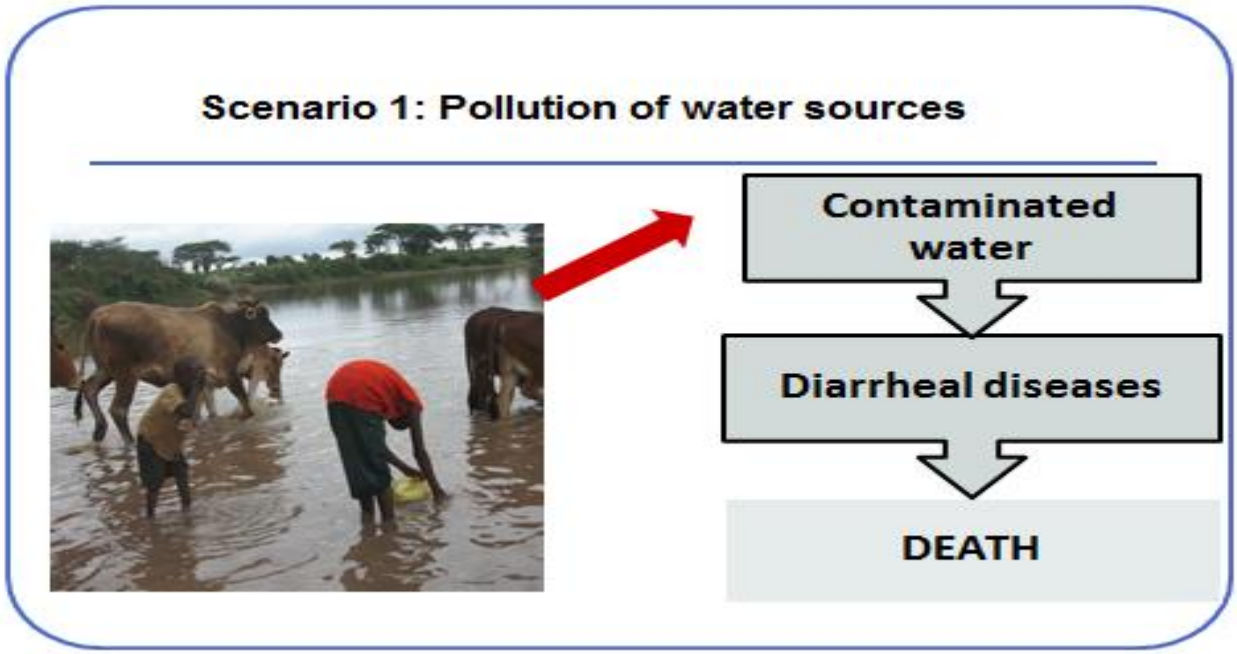
The lake basin is endowed with rich but overexploited natural resources – fish, minerals, wild animals, forests, water bodies etc.

Beautiful Towns/Urbanization

Tourist attractions

Areas of Human Health Challenges In Lake Victoria Basin

1. Environmental challenges
2. Water and sanitation challenges
3. Population dynamics
4. Health and SRH challenges



Scenario 2: Excessive logging

Poor crop production

Malnutrition

Death

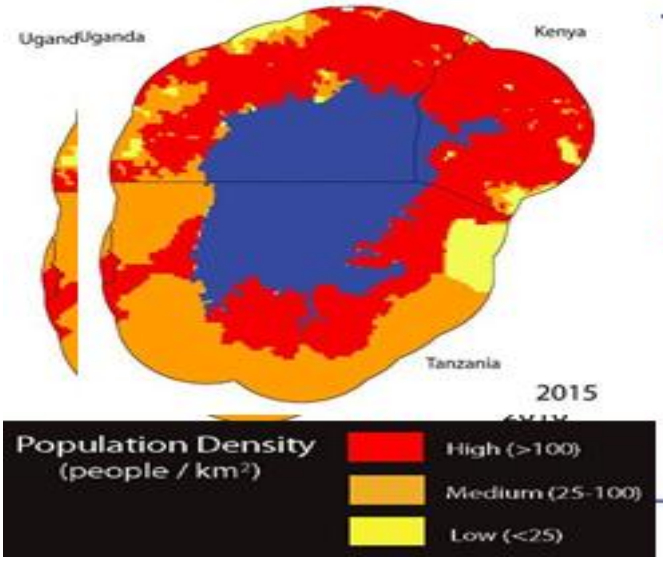
Environmental degradation

Poor crop production

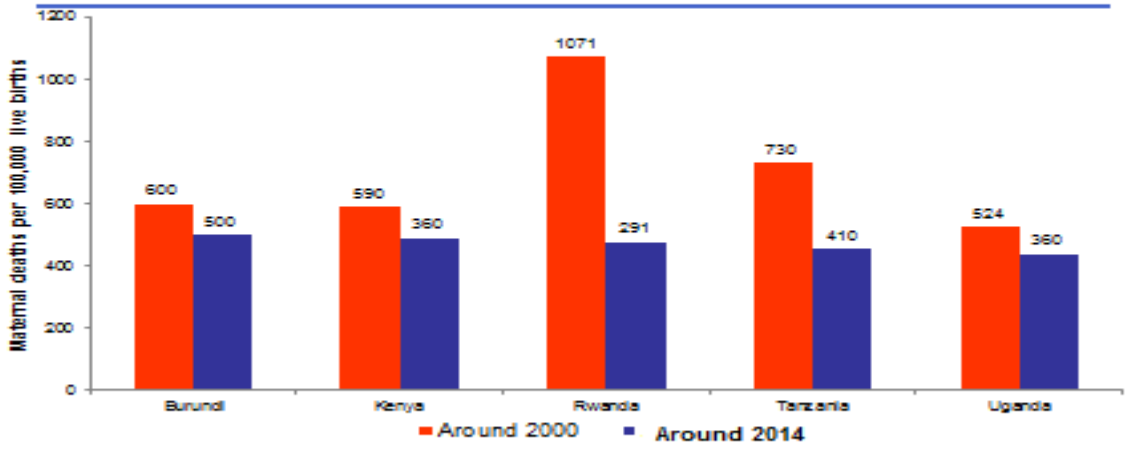
Malnutrition

Scenario 3: Unmanaged population

Unmanaged population

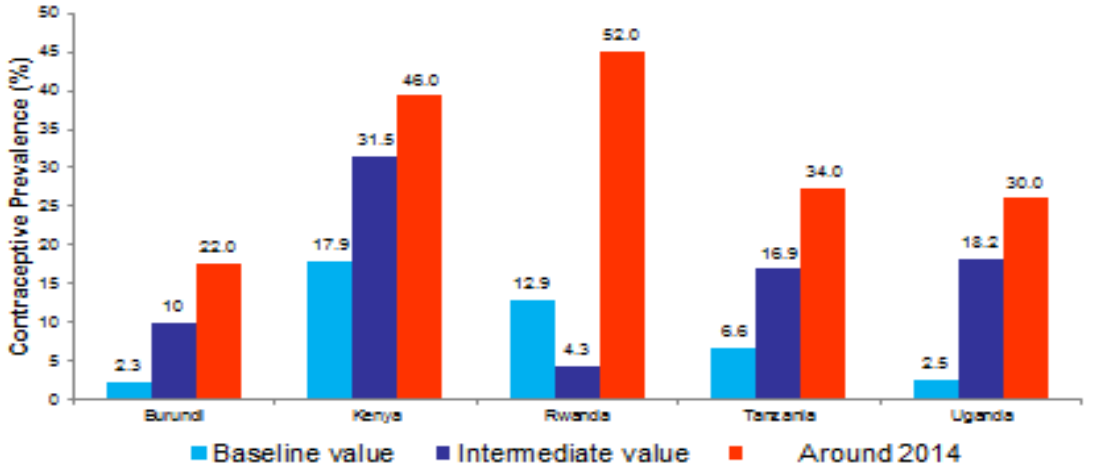


Trends in Maternal Mortality Ratios



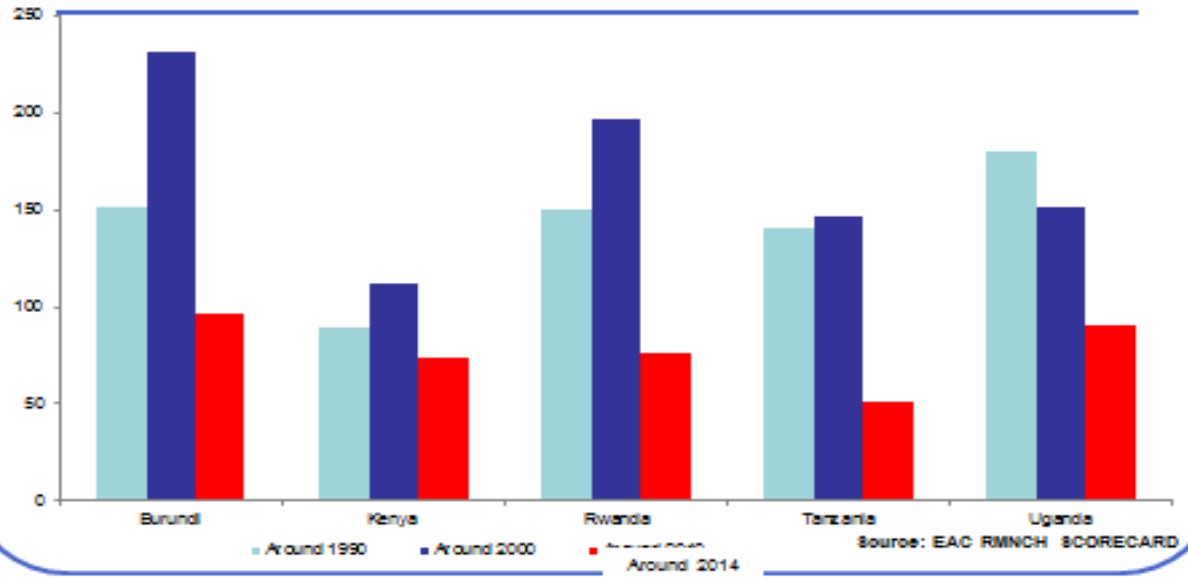
Data source: EAC RMNCH SCORECARD

Family Planning coverage



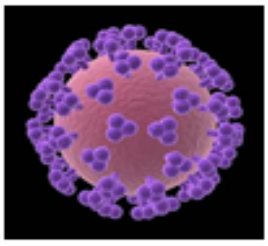
Source: EAC RMNCH SCORECARD

Under five mortality in the EAC



Infectious Diseases

- **Malaria** (Insecticide-resistant mosquito vectors, anti-malarial drug resistant parasites, changing climatic conditions favoring disease prevalence).
- **HIV** (Lack of testing, non-adherences to ARVs, abuse of PreP, VCT, VMMC)
- **Bacterial infections** (resistant strains to available anti-bacterial)



Emerging and Re-Emerging Diseases

NCDs

- Cancer
- Cardiovascular Disease (CVD)
- High Blood Pressure (HBP)
- Diabetes

Others

- Filariasis
- Schistosomiasis
- Elephantiasis
- Zoonotic Diseases

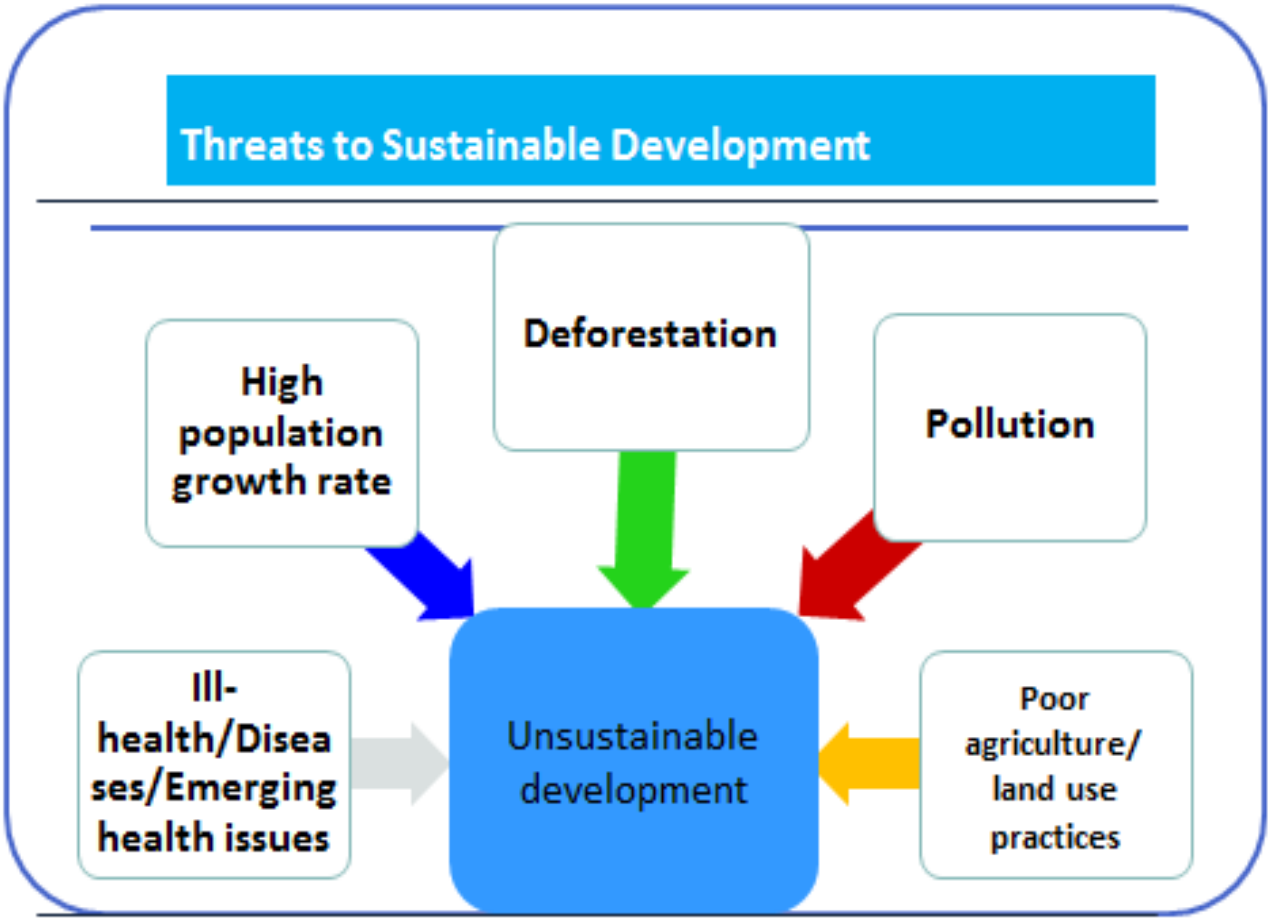
Universal Health Coverage

- **Great idea:** with a few challenges in management of the funds.
- Attitude towards such initiatives by middle to high class in society.

LGBT Issue: Unresolved

- High numbers of LGBT around the Lake region.
- Documented enrolment of 1211 MSM couples.
- Challenges with access to health services.

Night-Runners: Sports or a Health Hazard?



Health Challenges – how to respond

The critical aspects of addressing health

- Problem-driven research that advise policies
- interaction with policymakers and professionals in at varying stages of development,
- policy development by national organizations,
- questions of funding and prioritization,
- the social determinants of health,
- education, governance and capacity-building,

All take place within a complex political, moral and philosophical environment.

RESEARCH UNIVERSITIES

- *"……..complex political, moral and philosophical environment"*.
- Foster collaboration between academics at their own institutions, among the biomedical scientists, social scientists, engineers, epidemiologists, anthropologists, economists, psychologists, political scientists and historians.
    - Innovative research
    - Transformative education

WHAT CAN RESEARCH UNIVERSITIES DO?

- Develop cross-national collaborations addressing the major health challenges
- Develop sustainable public/private partnerships focused on applying innovative technologies
- Provide leadership in their own communities
- Tackle the local dimensions of health problems
- Public health, social determinants of disease, food security and food quality; waste, water and air quality.
- Educate Students, faculty, public.

REACTION(S) FROM THE PLENARY

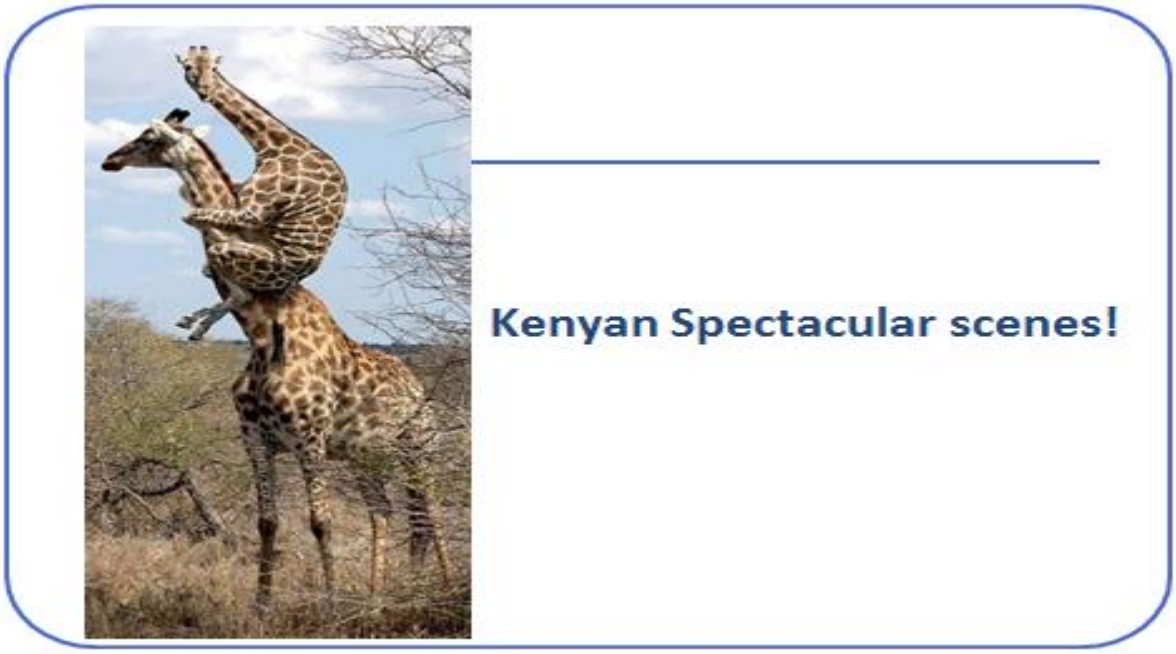
- What is queer and worth on the night runners is that they are an organization which is registered and it has a president. They operate in extreme confidentiality and even to get the data from them during research it has to be done in a discreet manner. They always would wish to be also anonymous during the research process.

- To gather the data on night runners the snowballing technique was quite effective.

RESEARCH TO POLICY IN AFRICA: A HEIGHTENED NEED FOR A CHANGING NARRATIVE

By Prof. Collins Ouma

Professor of Biomedical Sciences



Kenya: Achievements



Kenya: Not very good footballers...

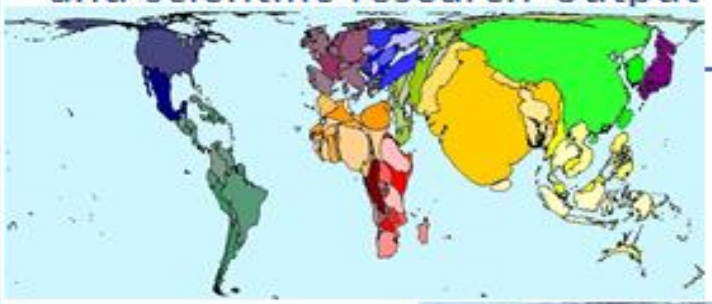


Giniwasekao!!!

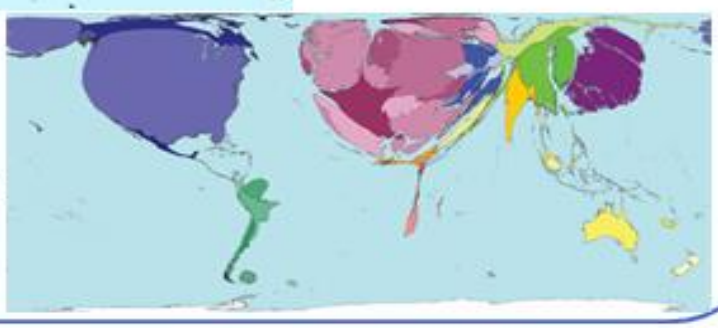
Only in Kenya: Presidential Election Nullified—Ended up with 2 Presidents!

Golden Handshake!

Two views of Africa in the World: population and scientific research output



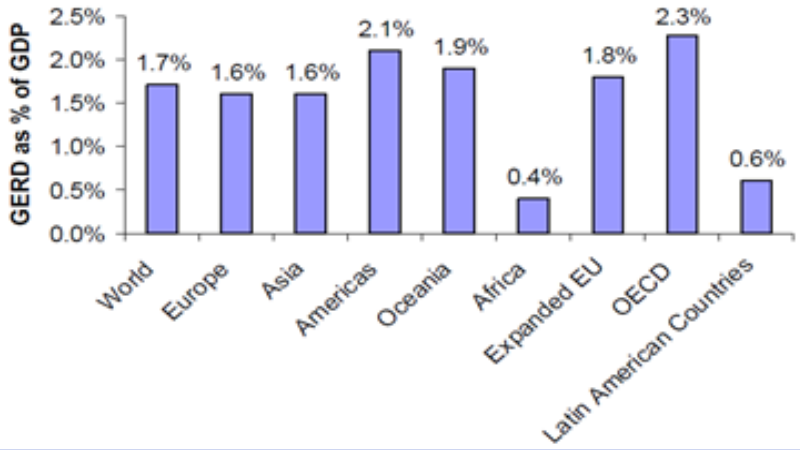
World population in 2001
Source: http://www.worldmapper.org/imagemaps/imagemap2.html



Territory size shows the proportion of all scientific papers published in 2001 written by authors living there.
Source:http://www.worldmapper.org/display.php?selected=2054

From: *New Scientist, 2008*

Africa within the World (2007)



- Is research important for decision-making?

Yes but…

9

Types of research use

Types of research use

- **Direct versus indirect use** — Where decision-making is based directly on research or, it affects understanding indirectly and maybe unintentionally.
- **Conscious versus unconscious use** — Decision-makers are to different degrees aware that they are using research.
- **Inform versus support decisions** — Where research is used to persuade or support existing thinking.
- **Timing** — Where research is used immediately or in the future.

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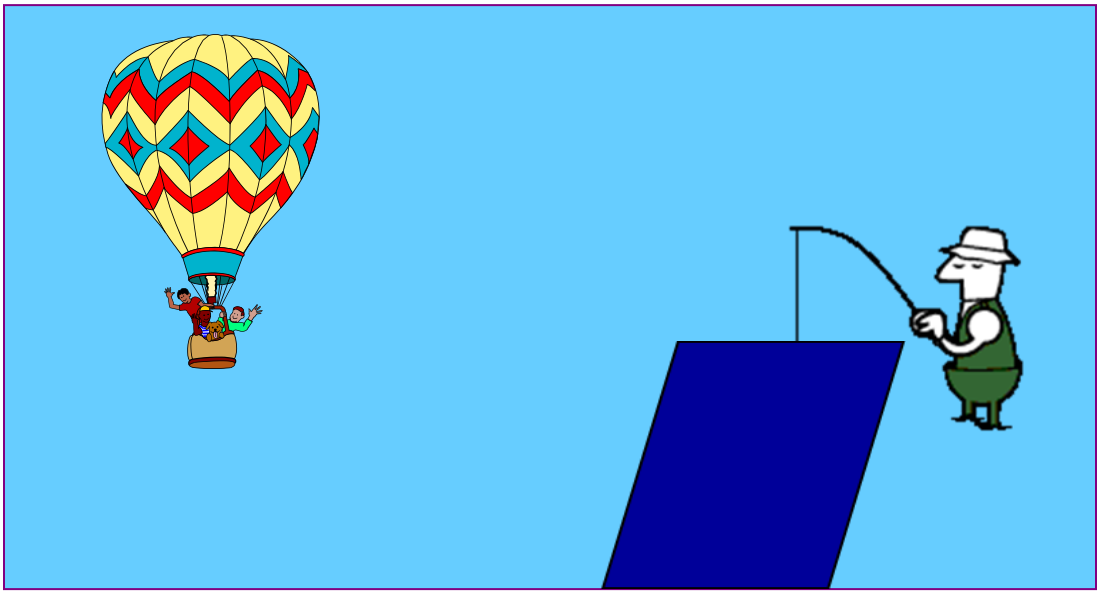
THE PROBLEM (PRESENTED IN SHORT SKIT)



Researcher: *(Inside a hot air balloon):* Where am I ?

Fisherman: *(By the river fishing)* You're 30 meters above the ground in a balloon.

Researcher: Yes, how did you know?

Fisherman: Because you don't know where you are, you don't know where you are going and now you're blaming me.

Researcher: You must be a researcher.

Fisherman: You must be a policy maker.

Researcher: Yes, how did you know?

Fisherman: Because what you told me is absolutely correct but completely useless.

But what if Imani was not so lucky to be born to Felake and Koffi, but instead was born in one of the slum communities where we work or other marginalized or conflict-ridden communities in Africa? What would her life story be? In the year 2015, many children are still being born in unsafe circumstances and growing up with no record of their existence.

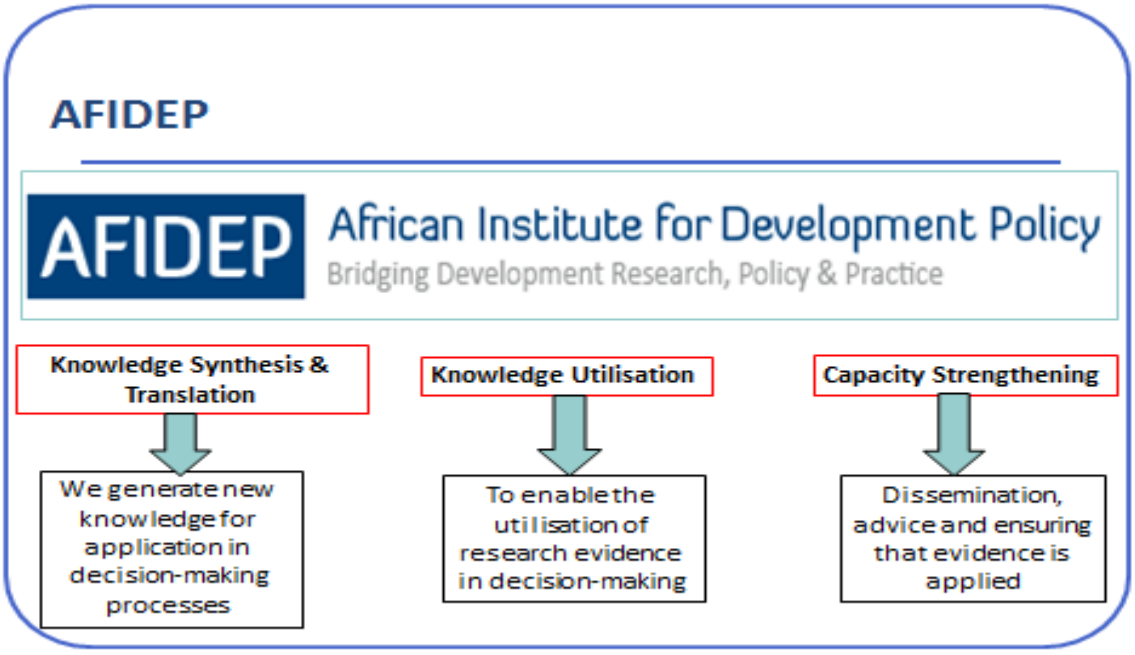
AFRICA'S REALITY TODAY

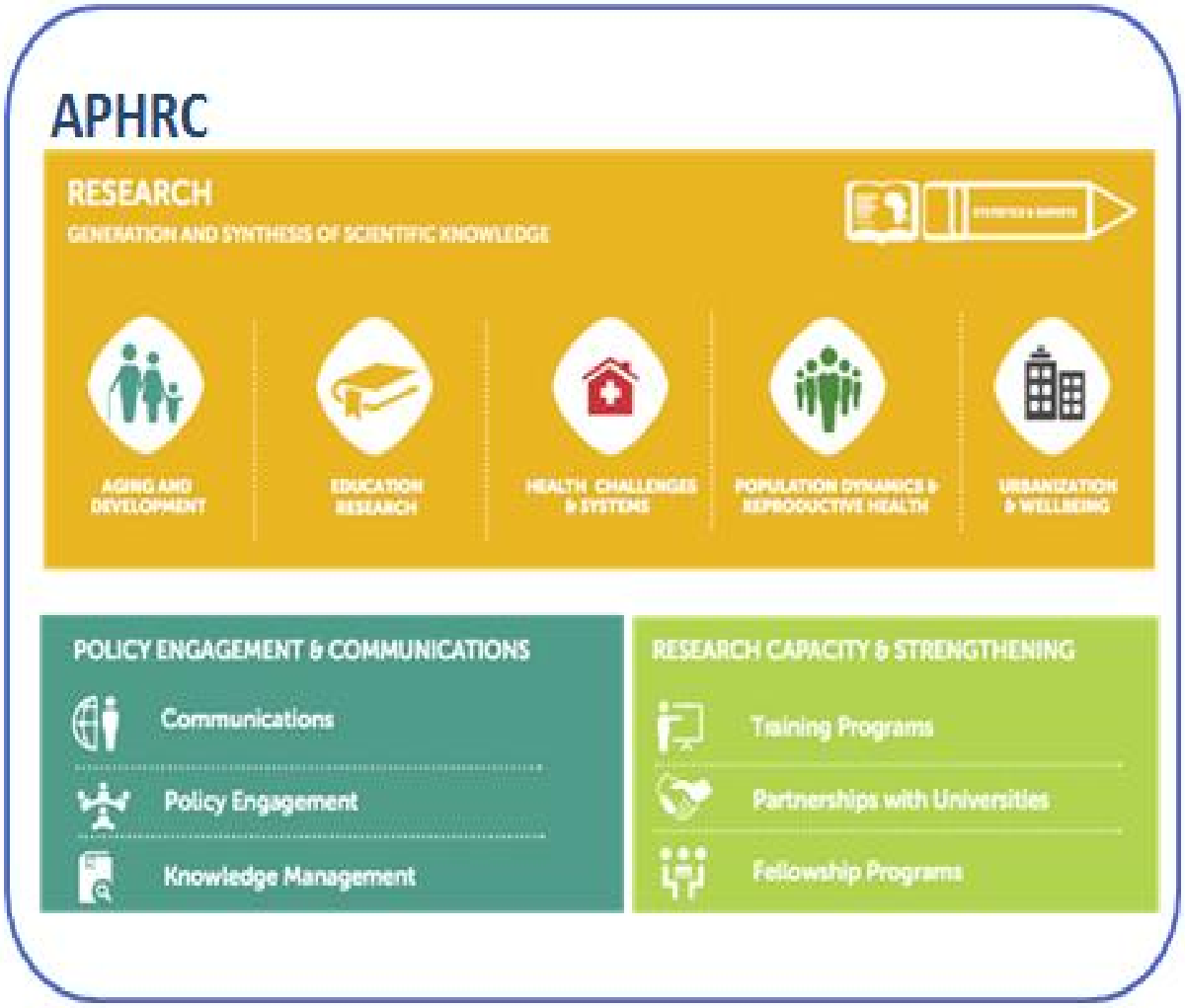
Many children are going to school every day, yet still finish school barely able to read or write, let alone master the critical thinking skills needed to advance the continent's economic development.

AFRICA'S REALITY TODAY

Too many adolescent girls in Africa experience unplanned pregnancies, drop out of school and are left with little chance to succeed in life.

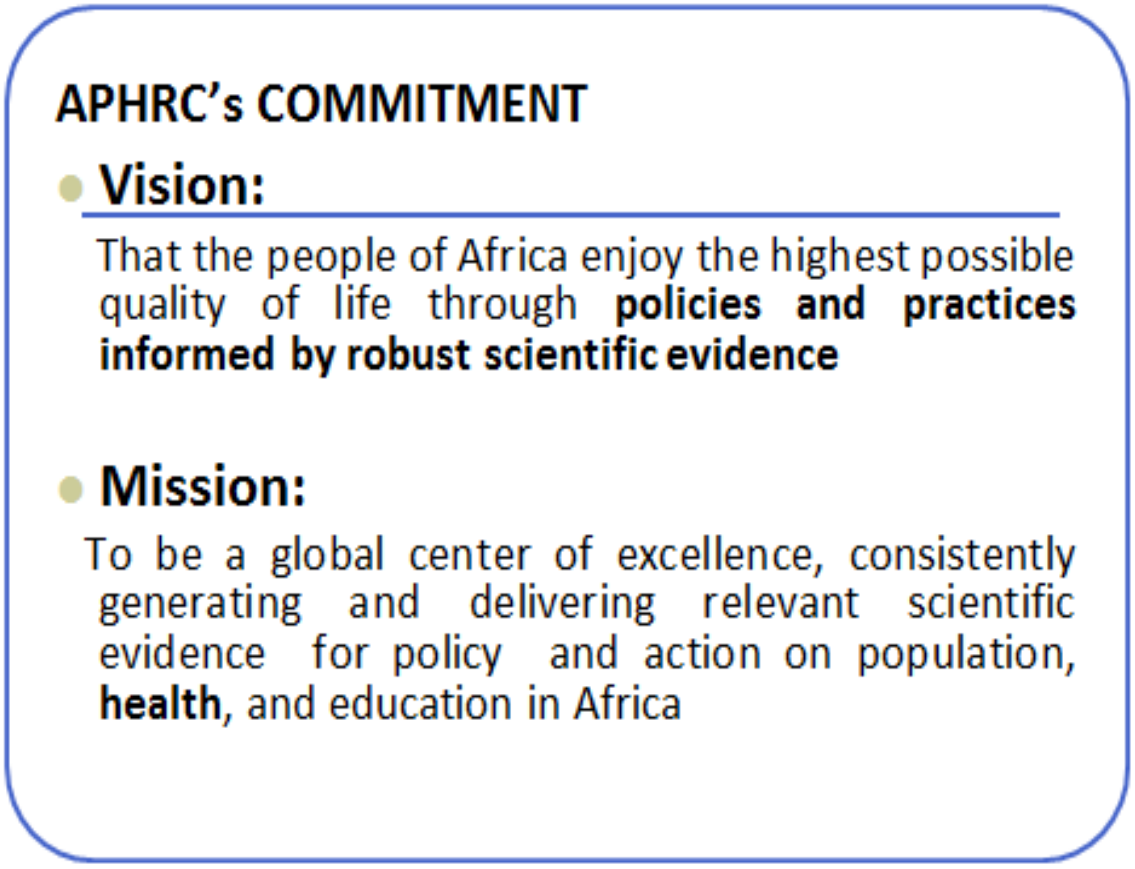
AFRICA'S REALITY TODAY


AFIDEP
AFIDEP
African Institute for Development Policy
Bridging Development Research, Policy & Practice
Knowledge Synthesis & Translation
We generate new knowledge for application in decision-making processes
Knowledge Utilisation
To enable the utilisation of research evidence in decision-making
Capacity Strengthening
Dissemination, advice and ensuring that evidence is applied

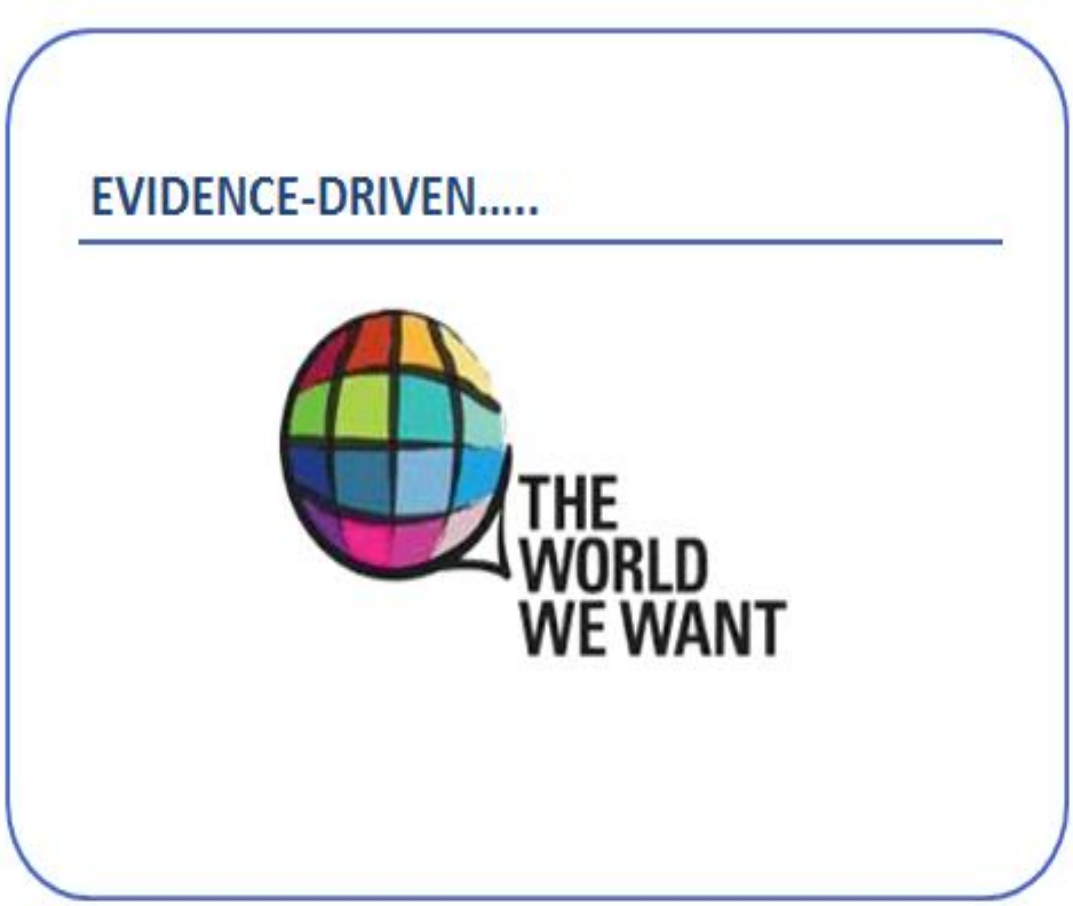


At the heart of our research is the drive to go beyond current challenges facing sub-Saharan Africa and the siloed approach to development. We know we must take a hard look at the region's development trajectory and how the confluence of various factors will influence development outcomes over the coming decades.

Our extensive work on urbanization and health, non-communicable diseases, strengthening data systems, ageing and development, and strengthening doctoral training and higher education in sub-Saharan Africa are examples of such effort to go beyond current crisis and emergency-driven approaches to development issues in sub-Saharan Africa.

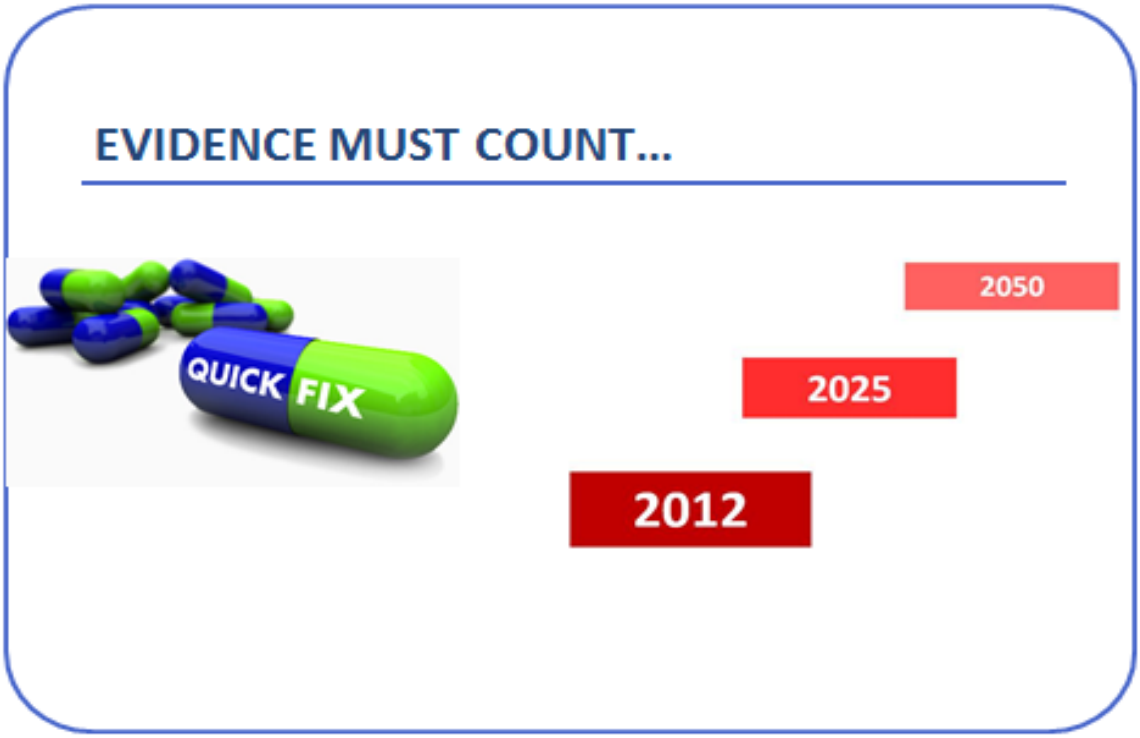


APHRC remains committed to generating the evidence base needed to put such issues on the agendas of governments and development partners before they become a crisis—and keep them there until they are addressed. We keenly understand that our job as researchers does not end with publishing in peer-reviewed journals, or even when policies and programs are changed or improved based on robust scientific evidence. It ends when the people of Africa enjoy the highest possible quality of life.



While this may be Africa's reality today, it doesn't have to be that way 15 years from now.

Today, African governments have the opportunity to turn things around. After 2015, we shift our focus away from the Millennium Development Goals to the Sustainable Development Goals. African leaders have the opportunity to, in just 15 years; help write a different narrative for every boy and girl born today.



Too often development efforts are focused on short-term quick fixes or emergency-like responses (even when there are no real emergencies).

When an individual, a household, community, district, nation or sub-region are faced with emergencies, decisions tend to favor short-term responses with little thought given to preventing future emergencies.

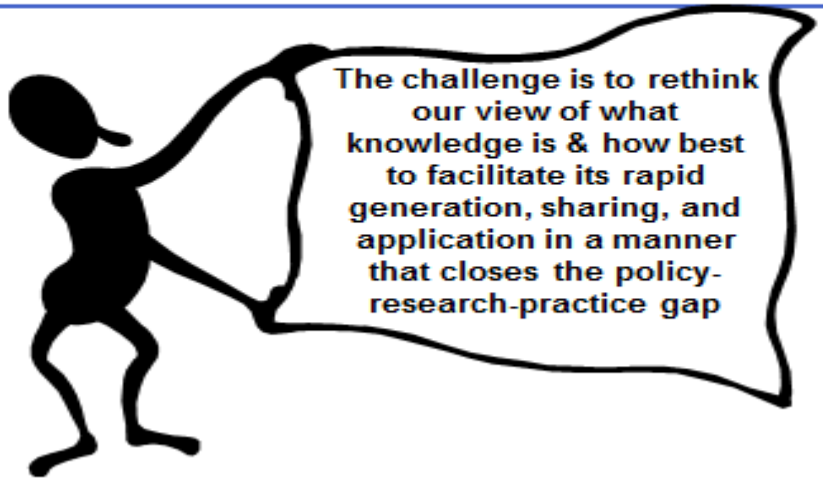
No country has escaped the vagaries of poverty without a long-term vision and plan. APHRC therefore decided early on to focus on issues that will be priority challenges for Africa into the future, and identify homegrown sustainable solutions to the problems of population and reproductive health, urbanization, health systems, education, and aging, all while developing some of the top researchers on the continent.

Three generations of knowledge to action (KTA) thinking

Knowledge transfer	Knowledge as a product – degree of use a function of **effective packaging**
Knowledge exchange	Knowledge as the result of social & political processes – degree of use a function of **effective relationships and interaction**
Knowledge integration	Knowledge as embedded in systems and cultures – degree of use a function of **effective integration with organisations and systems**

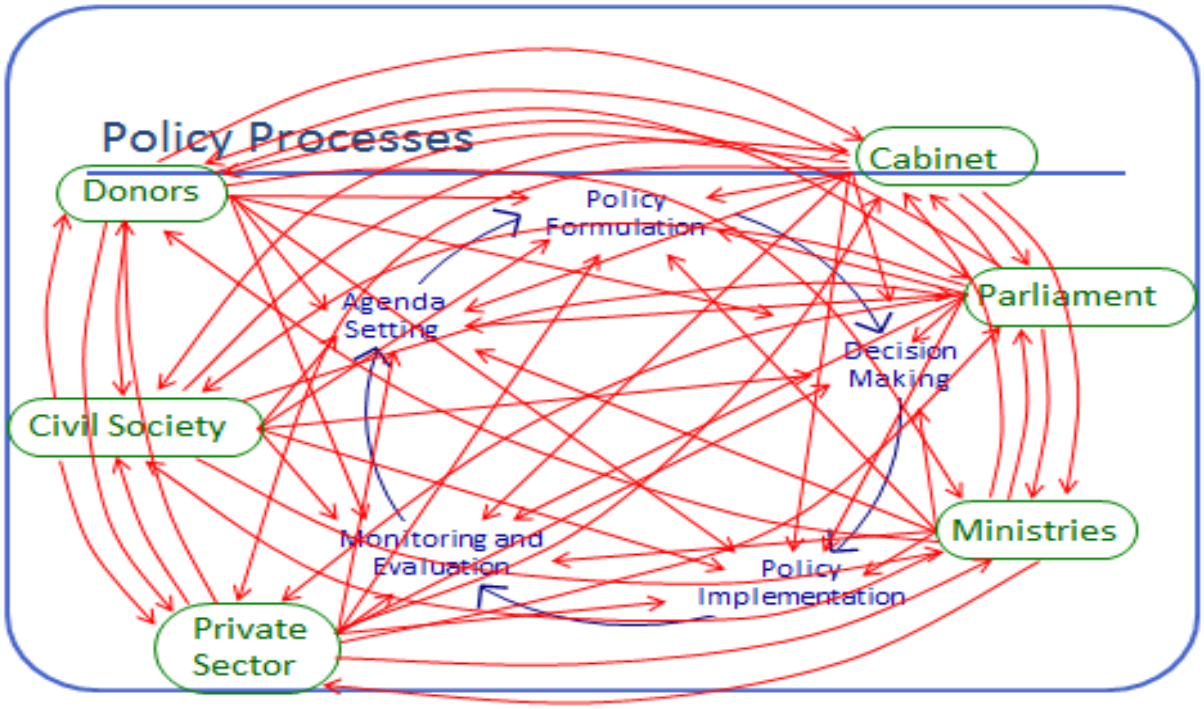
Source: **Best *et al.*, 2009**

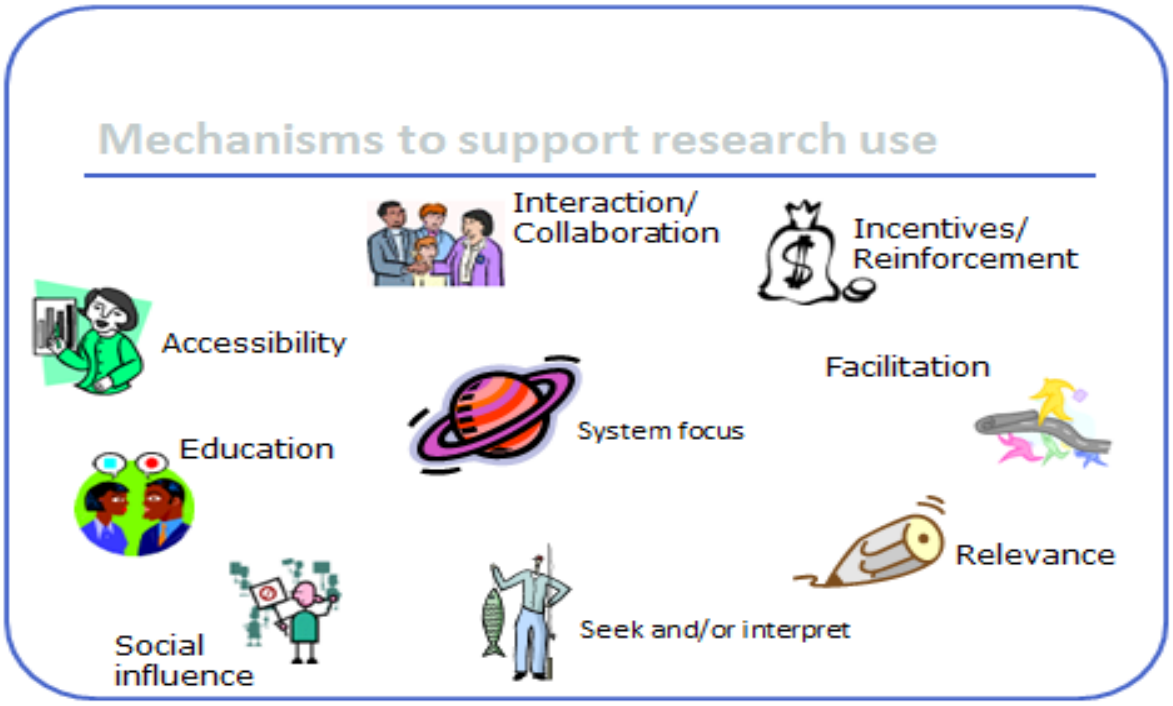
Knowledge needs to be managed more effectively in Africa than it has been in the past



Policy Processes

- Identify the problem
  - Commission research
    - Analyse the results
      - Choose the best option
        - Establish the policy
          - Implement the policy
            - Evaluation





GENERIC FEATURES OF EFFECTIVE PRACTICES TO INCREASE RESEARCH USE

- Research must be translated - adaptation of findings to specific policy and practice contexts
- Ownership is key – though there are exceptions where implementation is received or perceived as coercive
- Need for enthusiasts - champions - personal contact is most effective
- Contextual analysis - understanding and targeting specific barriers to, and enablers of, change
- Credibility - strong evidence from trusted source, including endorsement from opinion leaders
- Leadership - within research impact settings
- Support - ongoing financial, technical & emotional support
- Integration - of new activities with existing systems and activities

Source: Nutley et al 2007

We look onward to the next 15 years with great anticipation. With your continued support, we are certain that APHRC will continue to make its mark in shaping policy decisions with credible research evidence and influencing decisions that will improve health, education, urbanization, and population outcomes in Africa. Our vision is that in 2030, the thousands of Imanis born today across Africa will have a different, happier story to tell.

Take Home Message

'UNLESS someone like you cares [*about evidence*] a whole awful lot, nothing is going to get better. It' s not.'

(Dr. Seuss, The Lorax)

EPLIOGUE –CUM- VOTE OF THANKS

The chairman of the conference organizing committee Prof. Stephen Ogendo profusely thanked the participants for not only attending the workshop but for being active and lively during the presentation of the papers. He summed the workshop with one serious catchword: Tremendous !.

He thanked all the paper presenters for day one and two of the conference

Dr. Nancy Awuor Otieno
Prof. George Mark Onyango
Dr. Charles Otieno Ochieng
Mr. Paul Chege
Dr. Paul Mireji
Dr. Benson Nyambega (He was also the conference convener)
Prof. Philip Okinda
Dr. Patrick Onyango
Prof. Mathews Dida
Dr. John Ayisi
Archbishop Titus Zakayo Ingana
Dr. Roselida Owuor
Dr. Mary Aswan
Prof. John Agure Ogonji
Mr. Joseph Njogu
Dr. Chrispine Nyamweya
Prof. Joshua O. Ogendo
Prof. Collins Ouma

He also acknowledged the two presenters who presented their apologies

Dr. Pamela Oloo
Dr. Ally Matano
Prof. Noah Wasilwa

He expressed his gratitude to the organizing committee which included the following members:

Prof. Phillip Owuor
Prof. Raphael Kapiyo
Prof. Lucas Othuon
Prof. Ogonji Agure
Prof. Eric Nyambedha.
Dr. Owen McOnyango
Dr. Benson Nyambega
Dr. Nelson Obange
Dr. Lilian Magonya

Dr. Eric Okello
Ms. Rose Nyanga
Mr. Samson Moracha

He also showed his appreciation to the Conference secretariat:

Ms. Cynthia Guya

Mr. Philip Guya

He was grateful to the chairpersons who guided the presentation of the papers during the plenary sessions :

Prof. John Agure Ogonji

Dr. Pauline Andang'o

Prof. Geoffrey Netondo

Dr. David Ongarora

Ms. Violet Ndeda

He extended special thanks to :

The Vice Chancellor for his blessings and full support of the conference

DVC PRI office for coordinating the entire conference

The Master of Ceremonies Dr. Owen McOnyango for ensuring every segment of the housekeeping issues during the conference was well co-ordinated.

Maseno Hotel for providing the necessary conference space and the health breaks.

CLOSING REMARKS

These remarks were made by **Prof. Geoffrey Netondo** on behalf of DVC ASA , **Prof . Mary Kipsat.**

The workshop was academically and scientifically fruitful.

A positive derivative from the conference is that proceedings presented and discussed will motivate changes on how post-graduate studies and supervision of students will encounter some positive turn-around for the better. Some value addition will be encountered and witnessed.

Above he noted that two days for a conference was not adequate and in future they will plan to the make the workshop to have adequate days which will help the exhaust the content of the paper presentations and the plenary discussions.

Profuse thanks were extended to the following institutions for having brought it their expertise and experience in their presentations during the conference:

K.I.P.I

KEMRI

CDC

KMFRI

LVBC

Egerton University

This conference, he informed the participants will be annual event.

The workshop was declared officially closed at **2.04 p.m.**