PACN, KENYA HUB LAUNCH
UNIVERSITY OF NAIROBI, CHIROMO CAMPUS
27TH MAY 2008

Professor Jacob Kaimenyi, DVC Academic Affairs
HE Mr Adam Wood, British High Commissioner,
Dr Kilemi Mwiria,Assistant Minister of Education
Dr Simon Campbell CBE, Past-President RSC
Dr David Lawrence, Head of Research, Syngenta
Professor Mohamed Hassan, President of NASAC and CEO of TWAS
Dr Richard Pike, CEO RSC
Professor Shem Wandiga, Chair, Kenya hub
Professor Jacob Midiwo, Exec Sec, Kenya Hub
Professor Lucy Irungu, Principal CBPS
Professor Paul Shiundu, Dean School of Physical Sciences
Professor Duke Orata, Chair, Chemistry Department

After the official launch during the morning session, there was a half day scoping workshop where leading scientists from across Africa and worldwide were invited to participate, with the objective of setting the agenda for the PACN hub. The participants were divided into four break-out groups to discuss how the PACN should work with existing networks and how to promote research and innovation and facilitate education in the following areas:

- **Food and Agriculture**, *chaired by Dr Steve Smith and Professor Jacob Midiwo*
- **Health**, *chaired by Professor Michael Kishimba and Professor David Perrett*
- **Chemical Sciences and Education**, *chaired by Professor Shem Wandiga and Dr Alejandra Palermo*
- **Energy**, **Environment and Sustainable Water**, *chaired by Dr Richard Pike and Professor Runner Majinda*

FOOD AND AGRICULTURE

Chaired by Dr. Steve Smith (Syngenta, UK) and Professor Jacob Midiwo (University of Nairobi, Kenya)

Education

Issues

- Poor representation from rural schools in the universities
- Rural community education in areas such as disposal and use of pesticides
- Connecting relevant agricultural university research to rural communities
- Immediate *vs* sustainable effects of fertilizers (organic *vs* inorganic fertilizers)
- Under-representation of women in science – this implies that there is a shortage of women agriculture scientists
- General lack of knowledge dissemination from the universities
- Lack of motivation to study university chemistry

Opportunities

- Broaden PACN membership to include non-chemists who may be stakeholders in chemical research

- Incorporate real problems in project proposals *i.e.* offer guidance in proposal writing to incorporate stakeholders. Give a sense of real purpose to research and address local problems

Research

Issues and opportunities

- Need for innovative research to increase food production with limited resources in order to reduce reliance on food aid
- Preservation or storage which can lead to new control methods
- Novel processing and other value-added methods for food
- Improving yields *i.e.* traditional *vs* "new" crops
- Better understanding of nutrients particularly for traditional foods (database is needed)
- Creating awareness in the public about the important role of chemistry in the African society

Networking

Issues and opportunities

- Access to information
- Database of scientists/organizations/funding sources would be valuable
- Sourcing potential collaborators from or via PACN (research consortia). The PACN could serve as a 'Network of Networks'
- Establishing a credible research funding protocol by PACN to improve clarity of spending and encourage external funding
- Connecting/Sponsoring/Supporting young researchers
- Need for concrete outputs – avoid/learn from problems faced by other Networks
- PACN should support consortia to address real problems *e.g.* involve people with "problems to solve" in our conferences

Innovation

- Largely covered above
- Foster entrepreneurship by linking up with private companies – possible business input from Syngenta

HEALTH

Chaired by Professor Michael Kishimba (University of Dar es Salaam, Tanzania) and Professor David Perrett (William Harvey Research Institute, QMUL, UK)

Education

Issues

- Defining what health means within chemistry.
  Biochemistry: clinical biochemistry, analytical chemistry (*e.g.* generic drugs need quality control), diagnosis (curative and preventive)
  Forensic science, trace metals/elements (deficiencies and excesses)

Toxicology, metals, pesticides
Biosciences, pharmacology, clinical analysis, drug trials
Natural chemical products (therapeutic)

- African chemists need funds for research in the areas of generic drug production
- African chemists need training on generic drug synthesis and need to focus on locally important diseases and related problems rather than those of the developed world
- Lack of local/regional job opportunities
- Quality control requires analytical skills, counterfeit busting approaches should be developed (medicine should be affordable)
- Achievable practical experience in Africa: basic chemistry is core, more theoretical than practical

Opportunities

- Set up model equipments and experiments in schools
- Send students for industrial training in industries, chemical institutes, public sectors

Networking

- Find out what is going on across the continent and avoid duplication
- Bring people together across fairly broad interest groups *e.g.* medical chemists, analytical chemists, etc
- Exchange of teaching across African Universities
- Map RSC and Africa, find the current status and then fill the gaps
- Link up with other networks *e.g.* SEANAC, SETAC, NAPRECA

Research

- Attract funding from the government and others
- Need for lobbying bodies which can point out to governments the role chemistry plays in solving societal issues

Innovation

- Attract other funds to support the development of PACN in all areas of research
- Inter-country Olympiad
- Publicity with Syngenta on the front page

CHEMICAL SCIENCES AND EDUCATION

Chaired by Professor Shem Wandiga (University of Nairobi, Kenya) and Dr. Alejandra Palermo (RSC, UK)

Education

Issues and opportunities

- Education is for all in the society. At primary school level, chemistry can be taught with plastic bags and simple chemicals.

- Chemical sciences education in Africa varies from country to country—and information is not available on different countries curricula.
- Further instrumental training is required for African scientists either in UK or Africa
- Connecting African departments with chemistry departments in the developing world should be encouraged
- How can we engage young students in following a career in the chemical sciences?

Innovation

- Distribution of educational material by multimedia is not always possible
- Can we bring back at least one African University to international standards?
- New methods of teaching are needed
- Chemistry should be learnt by addressing practical problems
- Encourage South-South cooperation

Networking

- Questionnaire to all African countries on for instance, how is chemistry taught?
- Training programs
- University to innovate in developing instruments used in secondary schools
- PACN as vehicle of circulation of information for instance, center of physical measurements e.g.
  - Botswana – 600 MHz NMR
  - Addis Ababa – 100MHz NMR } should be accessible to all
  - Nairobi -200 MHz NMR
- Create database of equipments available in Africa for African scientists and optimize their use
- Distribution of books

Research

- How to find African collaborators
  - Identify funding opportunities for African scientists
- How to apply for joint grants
- Lack of knowledge on which instrument will continue to be available
- Unused equipment in the developed world (could be opportunities for Africans)
- Database of unused equipments should be matched with needs and training
- Natural products – excellent in Africa
- Who are the best chemists in specific area of research?
- Where are the best chemistry departments in Africa?
- Materials research is an area of great opportunity in Africa

ENVIRONMENT, WATER AND ENERGY

Chaired by Dr. Richard Pike (RSC, UK) and Prof Runner Majinda (University of Botswana, Botswana)

Education

Environment	Water	Energy
Distinctly African	Clean	Clean and renewable
'Green'	Affordable	Affordable
No pollution	Treatment	Solar
Increased awareness	Managed	Low investment costs
Sustainability	Available	Wind, water
Standards and strict rules	Safe	Biofuel, biogas
Recycling	Infrastructure	Balanced portfolio
Supportive	Used efficiently	Reliable
Restoration	Forestation	Oil
Compliance	Better storage	Sustainable
	Preservation of catchment areas	Used efficiently
		Exporting

Issues

- Population growth [*imbalance of resources, demographics*]
- Lack of technology [*not harnessing existing technology or developing new technology, inappropriate in some cases]*
- Wrong priorities [*short-term, driven by individualistic views of leaders*]
- Lack of 'level playing field' [*lack of free trade, Common Agricultural Policy (CAP) in Europe, market distortions driven by culture and history*]
- Lack of coherent policy [*education not linked to industry needs*]
- Cost [*leading to both lack of investment and funding of operations*]
- Poverty [*all-embracing, limiting health, markets, ambition and resources*]
- Corruption [*lack of law, governance, and transparency of processes*]
- Failure to implement [*lack of political will, reducing credibility and reinforcing downward spiral of limited investment*]
- Lack of research and development
- Lack of infrastructure
- Lack of knowledge [*limited education, ineffective flow of information*]
- Lack of management
- Insufficient investment
- Brain drain [*because of insufficient indigenous jobs to attract graduates*]
- Not using right experts or expertise
- Catastrophes, such as war, famine, disease
- Much of the Continent trapped in a 'vicious spiral' – success breeds success, but without demonstrable successes there is a reluctance to invest
- Mismatch between government and people's aspirations [*government may declare 'a laptop for every child', but what the population needs is health services and infrastructure*]

- Underlying need for processes, information systems and transparency in government, businesses and services

Opportunities

- Focus on small steps to demonstrate success, and create credibility
- Create centers of excellence, report and promote success, define expertise and relevance
- Place priority on coordination and coherence of policy
- Improve the attractiveness of the science, technology and skills of countries as perceived by potential investors
- Optimism and talent not being captured
- Inefficiencies in science—non-science engagement, which has to be addressed to develop better regulation and political decision-making
- Benefits of the extraordinary adaptability of Africa to extremes in climate
- Pockets of excellence not being communicated

Research

- Clarify routes to obtaining funding
- Encourage networking, and engage the non-science community
- Establish exchange programmes between personnel of different countries within Africa, and further afield

Innovation

- Recognize that Africa is not a homogeneous entity, and that country-specific policies need to be developed and implemented
- Can Africa benefit from the 'mobile phone effect' – that is, jump to new technology without being encumbered by the legacy of the old (eg landlines)
- Limited understanding over how to get money for research or entrepreneurial initiatives=

General comments

- *Must avoid duplication and link with other organizations working in Africa for Africa*
- How can we ensure continuity of PACN after 5 years? Think about the current political lobbying and new sources of funding.

Work collaborative with TWAS

- Compilation of innovative experiences – success stories from Africa
- Identification of the best departments – expand TWAS database
- Invite 50 young chemists to attend/participate in conferences through competition e.g. in the forth coming biodiversity conference

LIST OF PARTICIPANTS, THEIR AFFILIATIONS AND COUNTRIES

	Name	**Affiliation / Country**

1	Mesfin Redi	Chemical Society of Ethiopia
2	Ahmed Mustefa	University of Addis Ababa, Ethiopia and FASC
3	Prof. Motaza Mohamed Khater	Analytical Chemical Society, Egypt
4	Dr. Robert Mokaya	RSC/Syngenta Group, UK
5	Dr. Pete Licence	University of Nottingham, UK
6	Mr James Shikwati	Kenya
7	Ms Eve Watt	Royal Society, UK
8	Mr Jared Ogunde	Scientific Advisory and Information Network, Kenya
9	Prof. Michael Kishimba	Chemical Society of Tanzania and SETAC Africa
10	Dr. Simon Cambpell	RSC, UK
11	Dr. Richard Pike	RSC, UK
12	Dr. Steve Smith	Syngenta, UK
13	Dr. Alejandra Palermo	RSC, UK
14	Dr. David Lawrence	Syngenta, UK
15	Prof. Tony Rest	Chemistry Aid, UK
16	Dr. Chrispin Kowenje	Maseno University, Kenya
17	Milton Lore	Bridgeworks Africa Limited, Kenya
18	Judith Youziel	GSK, UK
19	Prof. Jamidu Katima	SAICM—Univ Dar es Salaam
20	Prof. Mohamed Hassan	TWAS and NASAC
21	Prof. Y.N. Lohdip	FASC and Nigeria Chemical Society, University of Jos
22	Prof. Egid Mubofu	University of Dar es Salaam, Tanzania
23	Dr. Polycarpe Nyetera	IRST, Rwanda
24	Prof. Runner Majinda	University of Botswana, Botswana
25	Prof. Kiremire	University Makerere, Uganda
26	Prof. Shem Wandiga	University of Nairobi, Kenya
27	Prof. Jacob Midiwo	NAPRECA, University of Nairobi
28	Dr. Charles Nguta	Kenya Chemical Society, Egerton University
29	Dr. Anthony Gachanja	JKUAT, Kenya
30	Prof. Okinda Owuor	Maseno University, Kenya
31	Dr. F. Okanga	Egerton University, Kenya
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33	Prof. Jacques Bukuru	University of Burundi, Bujumbura, Burundi
34	Prof. Paul Ndalut	Moi University, Kenya
35	Prof. Libasse Diop	Sheik Anta Diop University, Dakkar, Senegal
36	Dr. Dipali Chauhan	Institute of Physics, UK
37	Yobas Chebude	Addis Ababa University, Ethiopia Green Chemistry
38	Egwang	AAS
39	Dr. David Perrett	ACTF and University of London, UK
40	Prof. James Darkwa	SACI, University of Johannesburg