

ATDF NEWSLETTER

INNOVATION;

TECHNOLOGY;

TRADE;

DEVELOPMENT



“The road to development has no lanes or signs”

Issue No.1 Vol 1

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*Designed and
fabricated by TDAU*



Treadle pump

Making technology work for development; The case of TDAU, Zambia

The Technology Development and Advisory Unit (TDAU) at the University of Zambia is primarily a consultancy unit that provides testing, designing, fabrication, manufacturing, training and marketing services. On request, TDAU modifies existing technologies or produces original designs to meet the user's needs, conducts needs assessments and explore potential business opportunities.

TDAU provides small producers and industry with technological options that are based on locally available resources, simple to operate and maintain, are affordable and taking advantage of existing skills of clients.

The main areas of activity include food processing, building materials, rural transport and renewable energy. TDAU has worked with several development agents (e.g. AFRICARE, USAID), regional bodies (e.g. COMESA), international organizations (e.g. UNDP, UNIDO and

UNESCO) and the Government of Zambia. The Unit enjoys financial and administrative freedom from the University administration.

To view some of its products or for business opportunities, visit our website or contact The Manager, TDAU, P.O. Box 32379, Lusaka.



*A hygienic drinking
packaging and sealing unit*



Small-scale hammer mill

Financing opportunities for African businesses; CDC Group

Venture capital plays an important role in technology commercialization, provision of management support and match making, among others. The CDC group has been playing this role in Africa for over 55 years.

CDC has two venture capital firms operating in Africa: Actis and Aureos Capital. Actis has over US\$1 billion of funds under management in Africa. It facilitates the development and expansion of companies through equity financing. In addition, it helps firms structure complex transaction as well as development of management strategies.

Actis financing support ranges between US\$4 million - \$50 million and co-investment with other partners in larger projects. Actis has offices in Côte d'Ivoire, Egypt, Tanzania, Kenya, Nigeria, United Kingdom (Africa team), Zambia and South Africa,

Aureos Capitals is a joint venture between CDC Capital Partners and Norfund (Norwegian Fund for Developing Countries). Aureos supports primarily small and medium enterprises in developing countries. Its financing support ranges between \$500,000 and \$4 million. It supports business expansions, management buy-out and buy-ins, start-ups and acquisitions.

Since 2001, the Fund has supported about 60 projects in Africa. Aureos has offices in Ghana, Kenya, Mauritius, Mozambique, Nigeria, Tanzania, South Africa and Zambia.

For further information contact CDC group or country offices. For information on similar programmes on industrial support opportunities visit <http://www.atdforum.org>, or write to info@atdforum.org

Did you know?

AFRICAN AMERICAN INVENTORS

Did you know that the desire to contribute to the technological advancement of the world is not new? Representative George Washington Murray, U.S. Congressman and inventor from South Carolina from 1893 to 1897, speaking on behalf of a proposed legislation to publicize the South's technological progress said;

"Mr. Speaker, the coloured people of this country want an opportunity to show that the progress, that the civilization which is now admired the world over—the coloured people, I say, want an opportunity to show that they, too, are part and parcel of that great civilization."

He urged that a separate space be reserved to display some of the achievements of southern Blacks. He read the names and inventions of 92 Black inventors into the Congressional Record.

Among them Thomas L. Jennings (born in 1791) was granted a patent for a dry cleaning process. As a free tradesman he operated a dry cleaning business in New York City.



Thomas L. Jennings

Today the contribution of African Americans to technological development is well recognized, thanks to these pioneers. Read more on African American Inventors and their inventions.

Source: <http://inventors.about.com/od/>

Visit the
innovation centre
to view our
upcoming projects

ATDF website
www.adtforum.org
Email: info@atdf.org

Innovation and passion; the history of matches

Did you know that the bond of love between smokers and the matches has come a long way?.

Robert Boyle (1680) discovered that rubbing phosphorus and sulphur easily burst into flames. This one discovery ushered in an avalanche of fire-making devices and substances. However, most of them were cumbersome and dangerous. They ignited with a series of explosions that scattered pieces of fire all over the place.

In 1827, John Walker discovered that coating the sticks with chemicals such as antimony sulphide and potassium chlorate could also be used to produce fire. In 1832, smaller phosphorus matches were marketed in Germany and four years later, A. D. Phillips obtained a patent for the manufacture of friction matches.

The invention of amorphous (red) phosphorus in 1845 led to the development of the "safety" matches in 1855 by Johan Edvard (Sweden). He produced a matchbox with a specially prepared surface outside. This solved the hazard associated with matches.

Joshua Pusey (a lawyer and smoker), embarrassed by the large book of wooden kitchen matches that could not fit in the pocket, set to work on a paper matches that would be lighter and smaller. In 1889 he patented paper matches. Despite earlier resistance to the smaller and lighter matches, it has changed how fire is stored, carried around and ignited.

*Our scientific
power has outrun
our spiritual power.
We have guided
missiles and
misguided men.*

*(Martin Luther King Jr. Strength to
Love, 1963)*

*Let us know your
choice of technology
that changed the
world. Send a short
article to
info@atdforum.org*

The technology leadership programme

ATDF seeks to promote the participation of industry and professional associations in the technological development of nations. Such an initiative can be modelled along the lines of the World Economic Forum's Technology Pioneers Programme where executives of innovative firms take part in roundtable discussions to encourage a common understanding of the future technologies, their application and management.

ATDF seeks to broaden this model. About 30-50 companies across Africa that qualify as frontrunners could serve as technol-

ogy pioneers. The executives of these firms will work with scientists, academia, NGOs and government officials to forecast and develop practical policies and programmes that could promote business growth, investment flows and technology development.

ATDF will feature successful cases and experiences as well as bringing them to the attention of relevant partners.

Send in contributions that could make this model applicable, practical and useful in policy formulation in Africa

Technologies that changed the world: lighting

On 14th August 2003, approximately 50 million people in North Eastern US and neighbouring parts of Canada were plunged into darkness. They took a 'quantum leap' into the past and joined millions in poor countries still dependant on campfire, an invention made between 1.4 millions and 400,000 years ago. Since then man has made several strides in improving lighting technologies.

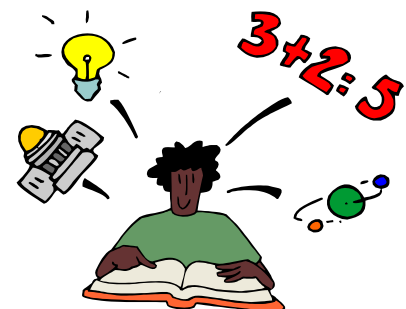
In brief, wood, twigs and grass were the sources of fuel for lighting until about 42,000 years ago when animal fat provided an alternative. This was followed by the development of the candle about 3000 BC. The discovery of petroleum in 1859 saved animals being hunted for their fat and ushered in the kerosene lamp. Petroleum was much cheaper than animal oil.

In 1885, Robert Bunsen invented the Bunsen burner, the major precursor of today's gas cooking and lighting equipment. However, a major leap was ushered in by the discovery of electric light bulb by J. H. Goebel around 1824 and later perfected by Edison in 1879, after conducting 1,200 experiments at a cost of \$40,000. Peter Cooper Hewitt later developed the fluorescent tube in 1901 based on previous work on phosphorescence and florescence. A team of General

Electric investigators later developed commercially viable florescent tubes in 1936.

At each stage man got more light from an equivalent amount of energy. For instance, the florescent tube provides at least 116,000 times more light than campfire and 600 times more than a kerosene lamp. Lighting technology has also spurred other inventions beyond simple lighting. These include the microscope, television, projector, telescope and camera. Today's, 'night vision' allows us to see in the dark and satellites in the skies enable us to see beyond our borders.

These developments have been driven by inventions in new materials and optical systems that deliver cheaper, high quality and safe light. For good or worse, lighting technology has changed the world.

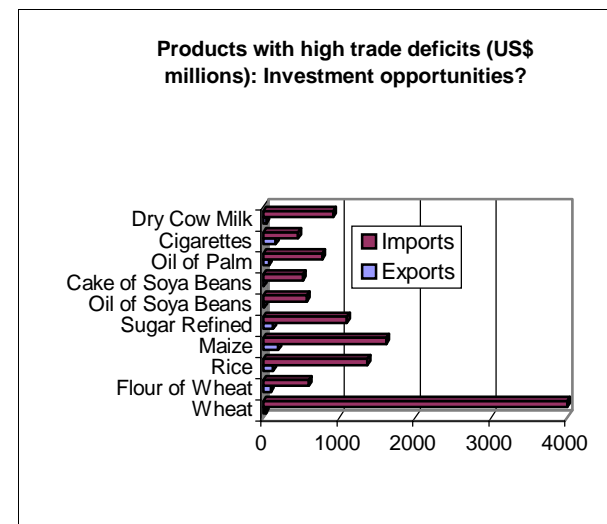
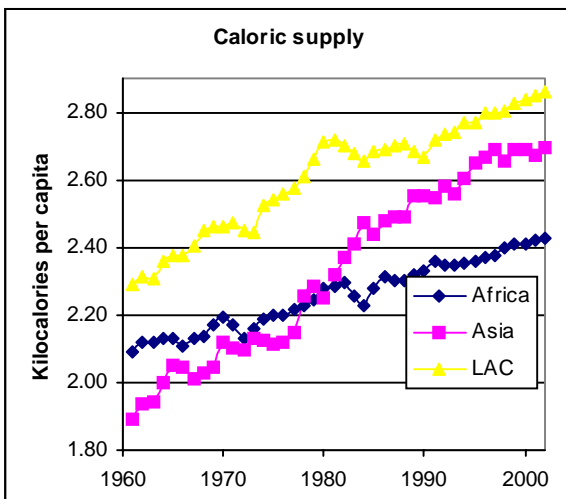
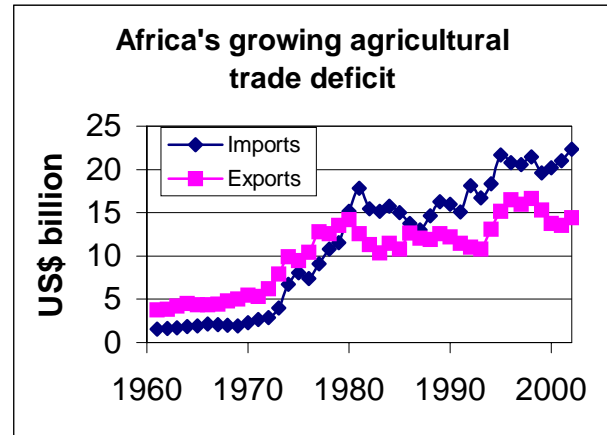
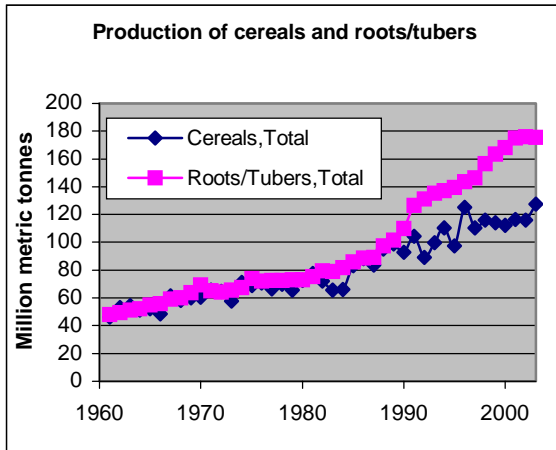
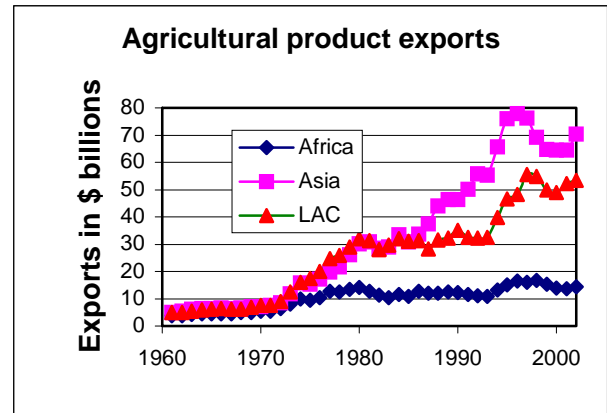


Africa's agricultural sector in figures

Production



Trade



Source: FAOSTAT

What are Africa's options for reversing these trends; food supply, increasing revenues and promoting development through the agriculture? share your experiences. Send your viewpoints to info@atdforum.org.

Ten Technologies that will change the world

Scientists are working on technologies that will change the world in the near future. The MIT Technology Review's editors identified 10 such emerging technologies.

Wireless Sensor Networks

Wireless sensor networks refer to the gathering of information using a network of sensors equipped with radio transceivers and data processors. For instance, birds equipped with such tools may monitor light, humidity, pressure, and heat in their environment and share it with others using a radio transceiver. We may all soon be part of the intelligence gathering networks.

Injectable Tissue Engineering

Injectable tissue engineering refers to the injection of specially designed mixtures of polymers, cells, and growth stimulators into injured joints to form healthy tissue. This will do away with surgery needed to insert implants. It may also be cheaper and provide alternatives to organ and tissue transplants.

Nano Solar Cells

The use of solar energy is constrained by the expense associated with silicon wafers that are produced by the same process used to make computer chips. This raises solar-power costs to as much as 10 times the price of generating fossil fuel. Scientists have developed a photovoltaic material that can be spread like plastic wrap or paint and could be integrated with other building materials. Cloth may in future generate energy. It promises to be cheaper and easier to use.

Mechatronics

Mechatronics is the integration of familiar mechanical systems with new electronic components and intelligent-software control. For instance, car brakes may in future use electromechanical actuators instead of hydraulic cylinders; wires instead of brake fluid lines and; software will mediate between the driver's foot and the action that slows the car.

Grid Computing

"Internet networking protocols" gave birth to the Internet and "hypertext transfer protocol" led to the creation of the World Wide Web. However, the emerging "grid protocols" promises to permit connection of almost anything else: databases, simulation and visualization tools. These tools promise to give home and office machines the abil-

ity to find resources wherever they may be, and assemble them on the fly into whatever applications are needed.

Molecular Imaging

Molecular imaging techniques allow researchers to observe genes, proteins, and other molecules at work in the body on a computer using fluorescent tags and calibrated filters. A radiologist can see the effects of the cancer on a molecular scale such as destructive enzymes secreted by the tumour. Such tools may also allow earlier detection of human disease and the effect of their therapies.

Nanoimprint Lithography

Nanoimprint Lithography refers to the technique of nanoimprinting surfaces. Scientists have shown that 'nano' features can be directly imprinted in silicon and metal. Flashing the solid with a powerful laser would melt the surface just long enough to press in the mold and imprint the desired features. This could lead to the generation of minute devices to power future ultra fast and cheap electronic and communication systems.

Software Assurance

When computers crash, a silent curse and a reboot does the trick. However, when they are running complex systems such as those that support air traffic control or medical equipment, a crash can be very expensive, and even cost lives. Scientists are creating tools that may yield nearly error-free software by developing a computer language and programming tools to rigorously test software.

Glycomics

The Biotech giant Amgen made a more potent version of its best-selling drug (a protein called erythropoietin) by attaching two extra sugars to the molecule. Scientists are working hard to turn sugars into drugs that could tame the immune system and treat health problems ranging from rheumatoid arthritis to the spread of cancer cells.

Quantum Cryptography

Who wants his secret known by competitors or opponents? Scientists are developing quantum cryptography to observe any attempt to view messages. This is based on the fact that viewing a quantum system inevitably alters it. The devices emit and detect the individual photons of light that make up the quantum signal.

*Reach your target
partners and clients
through
The ATDF
Newsletter*

*-Highlights emerging
technologies*

*-Profiles R&D
centres*

*Profiles organizations
supporting technology
and business
development*

*Emerging trade and
development issues*

*Monitors economic
performance of
specific sectors.*

Technology Index of African Countries

Technology index

Rank	Country	Score
1	South Africa	4.35
2	Mauritius	4.1
3	Tunisia	3.9
4	Botswana	3.78
5	Namibia	3.72
6	Egypt	3.64
7	Morocco	3.5
8	Kenya	3.36
9	Zimbabwe	3.34
10	Uganda	3.25
11	Gambia	3.22
12	Tanzania	3.22
13	Nigeria	3.16
14	Ghana	3.1
15	Senegal	3.04
16	Zambia	2.96
17	Mozambique	2.84
18	Cameroon	2.8
19	Malawi	2.79
20	Algeria	2.48
21	Madagascar	2.47
22	Angola	2.43
23	Mali	2.36
24	Ethiopia	2.17
25	Chad	2.06

Source: World Economic

*The only meaningful
concept of
competitiveness is
productivity*

(Peter Drucker)

The technology index (TI) measures the capacity to innovate, diffuse and acquire technologies, and penetration of information and communication technologies (ICTs). Countries are divided into two main groups: those that are core innovators and the non-core innovators. Core innovators are countries whose companies have registered at least 15 US utility patents per million population in the year under review while non-core innovators are countries whose firms have registered less than this minimum.

The division is based on the fact that innovation plays a dominant role in the economic growth of core innovators while technology acquisition play a dominant role for non-core innovators. Therefore the Technology Index therefore puts more weight on innovation for core innovators

and on technology transfer for non-core innovators. Core innovators get a zero weight for technology acquisition.

Technically, the **Technology Index** calculation may be given as:

Core innovators

TI = 1/2 Innovation-index + 1/2 ICT-index.

Non-core innovators

TI = 1/8 Innovation-index+ 3/8 technology transfer-index+ 1/2 ICT-index.

(Each index is composed of several variables)

The low score for most African countries reflect low levels of technology acquisition and penetration of ICTs.

Isn't it time most African countries considered establishing mechanisms to promote technology transfer?

ATDF in brief

The African Technology Development Forum (ATDF) is a platform for the exchange and dissemination of information on inventions and technologies as well as trends in global governance of technology and trade. The Forum brings together the entrepreneurial spirit of industry, the passion of scientists to innovate and the power of the government to marshal domestic and international resources to work for development.

ATDF runs the Trade Centre, the Tech Centre, the Innovation Centre and the Knowledge Centre as well as a newsletter to disseminate information.

The **Tech Centre** is largely a show room where technological products, services and methods are displayed. The goal of the Tech Centre is to stimulate innovations, promote formation of alliances, accelerate commercialization and enable matchmaking opportunities.

The **Trade Centre** highlights emerging market opportunities, market performance of African exports, trends in African

financial markets and business support services. It addresses international trading systems, trade and investment issues related to technology development and transfer.

The **Innovation Centre** is a place where practical projects and policies are developed or recommended. Indeed, research and development, industry and government could use the platform to tap into the global knowledge base to meet their own needs cost effectively.

The **Knowledge Centre** is a valuable resource base. The Centre has two main sections: Policy Documents and Technical Information. The Policy Documents host selected materials from international and national bodies, and provides abstracts of policy papers. The Technical Information hosts technical papers that are likely to be of interest only to experts in those areas.

YOUR **SPACE** TO
REACH

**BUSINESS LEADERS, POLICYMAKERS,
MANAGERS, SCIENTISTS
AND MANY
MORE**

Announcements

Africa Development Forum IV "Governance for a Progressing Africa (ADF) IV by ECA-ADB and African Union. 11 to 14-October 2004 Addis Ababa, Ethiopia
Email: rokello@uneca.org.

O'Reilly Emerging Technology Conference (ETech) March 14-17, 2005 at the Westin Horton Plaza in San Diego, CA, USA. Contact confreg@oreilly.com

7th annual conference and 2nd annual exhibition
Power Generation World 2005;
Transmission and Distribution World 2005
Gallagher Estate, Midrand, South Africa
18-22 April, 2005

3GSM World Congress 2005
The number one place to experience the very latest innovative devices, applications & services driving the industry, Cannes, France, February 14-17, 2005