

South African Local Innovation Systems and African Regional Integration

Local Innovation and Production Systems Seminar

IERI, Pretoria

3 April 2012

Garth Williams

Director: Advanced Manufacturing Technologies
Socio-Economic Partnerships
Department of Science and Technology



Outline

- Policy context
- Local Innovation
- Africa Agenda in the Ten Year Innovation Plan
- Regional Integration



Policy Context

- **White Paper on Science and Technology (1996)**
 - NSI anchored on the concept of innovation (“...the application in practice of creative new ideas”)
 - Imperatives of employment creation; importance of knowledge generation; S&T infrastructure; development of human resources
- **National Research and Development Strategy (2002)**
 - “Frozen demographics”; “Innovation Chasm”
 - NSI “...a set of functioning institutions, organisations and policies that interact constructively in the pursuit of a common set of social and economic goals and objectives, and that use the introduction of innovations as the key promoter of change”
 - Technology and innovation missions central for economic growth, wealth creation and improvements of quality of life
 - Technology missions: biotechnology, ICT, advanced manufacturing, leveraging resource-based industries and technology for poverty reduction

Policy Context cont...

- **Advanced Manufacturing Technology Strategy (2003)**
 - Aim: to assist in improving the competitiveness of the SA manufacturing sector via targeted programmes that have an impact on industry development, world-class manufacturing, and innovation and R&D; all underpinned by human resource development
- **National Framework for Local Economic Development (LED) in South Africa (2006 – 2011), Stimulating and Developing Sustainable Local Economies (2006)**
 - Aim: To support the development of sustainable local economies within the notion of developmental local government

Policy Context cont...

- **National Industrial Policy Framework (2007), Industrial Policy Action Plan (2007 & 2010)**
 - A diversified economy beyond its traditional reliance on commodities
 - Intensification of industrialisation and movement towards a knowledge-based economy
 - A more labour-absorptive industrialisation path
 - Mainstreaming disadvantaged economic citizens and marginalised regions
 - Contribution to industrial development in Africa
- **Ten Year Innovation Plan (2008)**
 - Focuses on scientific research in order to derive socio-economic benefit for SA
 - Transformation towards a Knowledge Economy; 5 Grand Challenges; the "Innovation Chasm"; IP protection; HRD; knowledge generation & exploitation
- **New Growth Path (2010)**
 - Aims: create decent work, reduce inequality and defeat poverty
 - Target: five million jobs created by 2020 (based on GDP growth of 4-7% per annum)

Policy Context cont...

- **Draft National Development Plan Vision for 2030 (2011)**
 - Target: creating 11 million jobs by 2030
 - S&T listed as one of the key drivers of change, with economic advances being ascribed to technological and scientific revolutions and their application
 - Breakthroughs in S&T also associated with improving the lives of the poor and eliminating poverty
 - The measure of economic development for a developing country such as SA relates to how well it is able to creatively apply S&T

R&D-led Industrial Development

- Policy context: Economic growth and employment creation are foremost on the national agenda.
- DST involvement: Why?
- Technological innovation is seen as a key enabler of socio-economic development.
- State-led focused R&D programmes are mainly aimed at unlocking new markets, establishing strategic capabilities or supporting infant industries, i.e. industrial development technological breakthroughs.
- DST partners with key stakeholders in government, industry and R&D organisations to bring about growth and employment through the development, demonstration, transfer and adoption of new technologies in the economy.

DST's Local Innovation Programme

DST's activities revolve around the formation of Regional Innovation Forums at the provincial level. The main tasks of these forums are:

- Facilitate regional innovation systems strategic planning and policy development
- Promote networking amongst regional innovation systems stakeholders within the region
- Coordinate innovation programmes and initiatives within the region
- Create awareness on innovation in the region
- Act as conduit to innovation programmes and initiatives initiated at national level

Current focus on Eastern Cape province as a pilot project (Innovate Eastern Cape; development of a Provincial Innovation Strategy)

DST's Local Innovation Programme observations

Business community - reportedly sceptical concerning programs emanating from municipalities.

Belief that a neutral entity in the form of a Regional Innovation Forum is best to drive innovation and LED.

Business sector and universities are largely not involved in LED programmes, with the result that most LED projects are more social impact in nature (e.g. community driven piggery, hatchery), with very few truly innovation-driven projects.

Policy mis-alignment and disconnection:

- Economic development policy at three tiers of government (national government policies, the Provincial Growth and Development Strategies and Integrated Development Plans of municipalities)

- Within the DST (the Ten Year Innovation Plan and local innovation)

Poor understanding of local innovation systems in government, although this is slowly improving.

Other bottlenecks: institutional structures to support local RDI and a shortage of funding for innovation instruments (e.g. incubators & science parks), as well as local innovation system practitioners within the DST (there should be one per province, with additional resources freed for large projects, e.g. the SKA).



Ten Year Innovation Plan

Grand Challenges – opportunities for steering SA's resource-based economy towards a knowledge-based economy

The bio-economy

SA a leader in biotechnology and pharmaceuticals, based on the country's indigenous resources and rich biodiversity, and its expanding knowledge base.

Space science and technology

SA a key contributor to global space S&T, with a National Space Agency, a growing satellite industry, and a range of innovations in space sciences, earth observation, communications, navigation and engineering.

Energy security

A safe, clean, affordable and reliable diversified energy supply for SA: innovating for the long term in clean coal technologies, nuclear energy, renewable energy and the promise of the "hydrogen economy".

Global change science with a focus on climate change

Leveraging SA's geographic position to play a leading role in climate change science.

Human and social dynamics

SA contributing to a greater global understanding of shifting social dynamics, and the role of science in stimulating growth and development.



The Africa Agenda in the Ten Year Innovation Plan

- Indicators to measure SA's progress in transforming towards a knowledge-based economy – need more appropriate indicators?
 - GERD as a proportion of GDP in comparison to the OECD
 - Number of SA-originated US patents (issues of quality compared with patents filed in SA?)
- Space S&T grand challenges
 - Outcomes: Earth observation data available to all of Africa; data originating from satellites designed and manufactured in Africa; construction of a powerful radio astronomy telescope (SKA)
- S&T in response to global change grand challenge – SA leading research in Africa regarding understanding and projecting climate change, the impact of the projected changes and mitigating to limit the effects of the changes
 - Outcomes: a climate change research and modelling capability for the entire continent, and regional scenarios for the rate and impact of climate change and extreme weather for the continent

The Africa Agenda in the Ten Year Innovation Plan cont...

- Human & social dynamics grand challenge – positions SA as an important player in Africa, linked to public engagement with science, poverty, indigenous knowledge and heritage amongst others.
 - Outcomes: SA a social sciences research knowledge hub in Africa

Gaps in the Ten Year Innovation Plan?

- A large cohort of African students study at SA universities, but its is extremely difficult for graduates to remain in SA. On the other hand, SA faces huge challenges relating to the production of the required numbers of knowledge workers (schooling system & PhD supervision capacity).
- Bio-economy grand challenge: Challenges unique to SA and to Africa, e.g. diseases common to other African countries especially diseases of poverty like malaria, tuberculosis and HIV/Aids.
- The section on international relations and technology transfer strategies says SA must work to become a preferred destination for S&T investments through cooperation and coordination through international and regional forums, and via targeted initiatives with other developing countries.
- Outcomes: SA a leading player in the implementation of the African Research Area under the AMCOST and stronger relationships with regional entities including the ACP (a regional entity that seeks primarily to obtain funding from the EU with the objectives of sustainable development and poverty reduction).
- No mention of formal interaction with the AU / Nepad

Gaps in the Ten Year Innovation Plan? cont...

- Introduce LSIs & RSIs & do away with “NSI”?.
- South Africa take a leading role towards regional integration via the establishment of a Sub-Saharan system of innovation?

Africa's History in three bullet points

- Mercantile capitalism & "Triangular Trade" (late 16th – early 19th centuries) – manufactured goods from Europe to West Africa; goods traded for slaves; slaves traded in Americas to plantation owners; sugar, tobacco and cotton sent to Europe; commodities traded for manufactured goods.
- Colonialism – Africa exploited for its raw materials by foreign powers through exploitation of cheap indigenous unskilled labour pools; no intention to develop the productive capacity of the colonised; infrastructure developed to export raw materials (which has largely deteriorated).
- Leaders of former colonial African countries have largely perpetuated the colonial system and enriched themselves at the expense of their people, thereby entrenching neo-colonialism, causing brain drain and capital flight, and perpetuating reliance on foreign earnings from raw materials exports as it continues to de-industrialise.

Regional Integration – A Panacea for African Socio-Economic Growth?

Theory: Integration is vital to attain economic viability via the creation of duty-free common markets at a regional and ultimately a continent-wide basis.

Anti-Regional Integration (M Mbeki)

Will not work because Africa does not have the same material and political conditions that led to the creation of the European Union.

- EU composed of countries with approx. same levels of industrial uniformity compared with most African countries which are not industrialised.
- Africa's political history sets it apart from states in Europe and Asia which have evolved over centuries to produce states enjoying the support of the majority of its citizens. (Artificially-created African countries from 1884-1885 Berlin Conference – citizens of African states do not feel a strong allegiance towards their country.)

In 1960s calls for regional integration were issued, several regional bodies were formed

Claims: Very little to show for these efforts (levels of intra-Africa trade are miniscule compared with trade with the rest of the world; lack of a sufficiently sound trading base endures despite the prevalence of such economic

Regional Integration – A Panacea? Cont...

Pro-Regional Integration

- Despite criticism against regional integration, the AIO authors maintain that pan-African integration, even though improbably, is necessary for Africa to become globally competitive despite poorly-developed industrial bases and populations with limited purchasing power (amongst others) to develop a local competence, especially in the current free trade era where infant industry protection is not an option any more.
- Given ever-increasing globalisation, the AIO authors maintain that the “national” portion of African country’s national systems of innovation is becoming irrelevant in post-Colonial Africa, and that integration of systems of innovation into regional systems of innovation and eventually into a Pan-African system of innovation is necessary. (Cross-border mobility of people and resources; integration of national legal frameworks etc...)
- Moves towards an African system of innovation already contained in existing country treaties and sub-regional/continental agreements, as well in the current AU strategic plan. There are also early-stage efforts amongst SADC, ECOWAS and the nascent EAC regional groupings to acknowledge the important role of S&T within the context of regional economic integration.



Thank-you

Garth Williams

Director: Advanced Manufacturing Technologies

garth.williams@dst.gov.za

+27(0)12 843 6435 (office)

+27(0)82 267 1246 (mobile)

