

Government's role in developing solutions for diseases that disproportionately affect developing countries

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Introduction

- ◆ Inequalities in health and food security keep widening between developed and developing countries, esp. SSA *e.g. infant mortality rate, TB prevalence, food production rate less than population growth rate.*
- ◆ Safe development & application of biotech to address these face a number of challenges.

Factors determining the future of biotech in Africa

- ◆ **Proactive policy**
Africa deciding for Africa
- ◆ **Biosafety legislation and institutions**
Ability to assess the technology for ourselves
- ◆ **Scientific capacity building**
Ability to appropriate and adapt biotechnology
- ◆ **IPR regimes**
Protect and encourage private investment
- ◆ **Public awareness and acceptance**
Credible competent communication

AU-NEPAD S&T Consolidated Plan of Action

Flagship R&D Programmes:

- ◆ Biodiversity, Biotechnology & Indigenous Knowledge;
- ◆ Energy, Water & Desertification
- ◆ Material Sciences, Manufacturing, Laser & Post-harvest Technologies
- ◆ Mathematical Sciences
- ◆ Information, Communication & Space Science Technologies.

NEPAD Biosciences Initiative: Policy Processes

- ◆ African Science, Technology and Innovation Indicators Initiative- *to monitor Africa's scientific and technological development; useful in formulating, adjusting and implementing STI policies.*
- ◆ High level Panel on Modern Biotechnology- *to facilitate open & informed regional multi-stakeholders dialogue associated with /raised by rapid development of modern biotechnology.*

NEPAD Biosciences Initiative



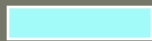
NABNet, Cairo, Egypt



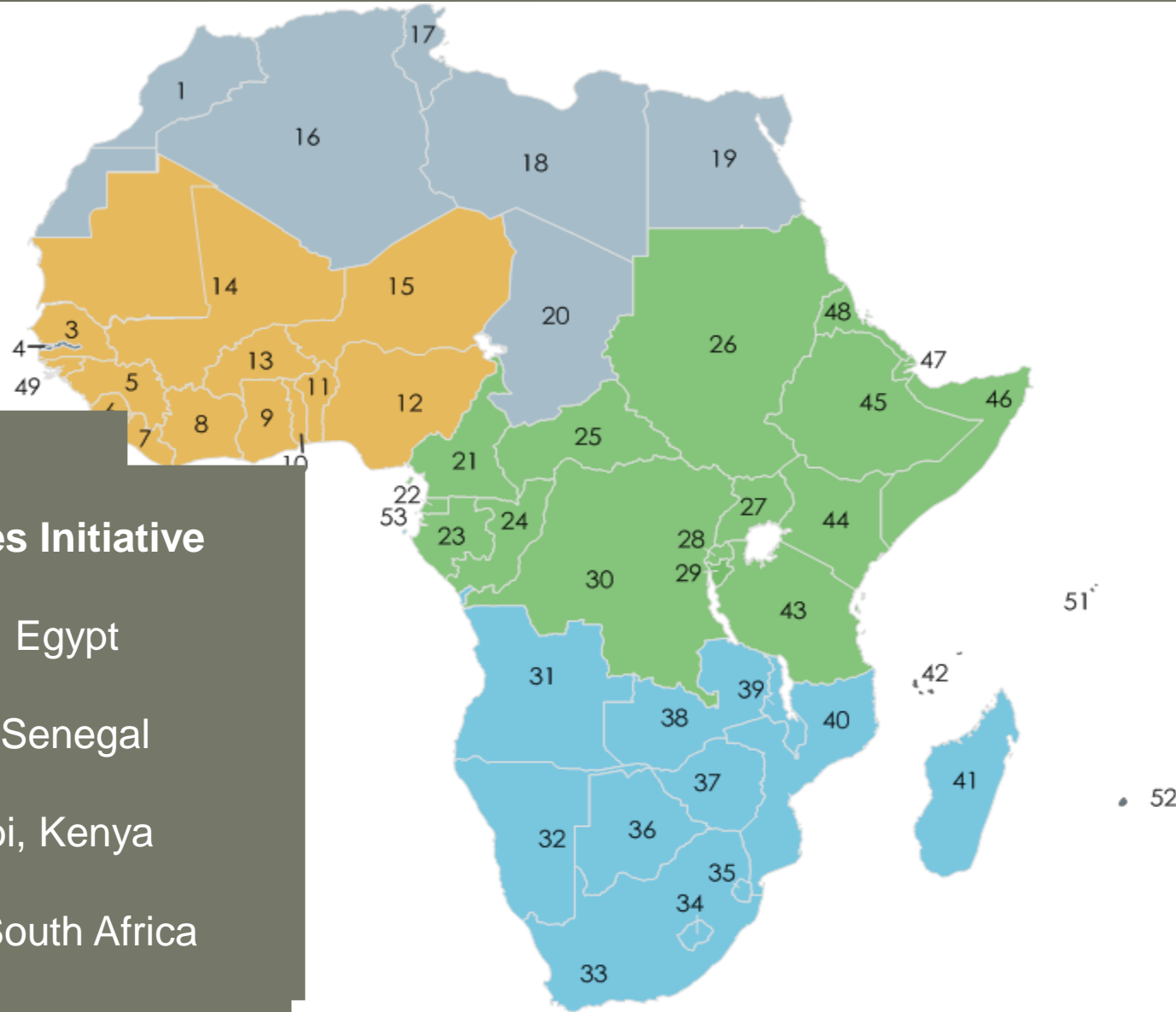
WABNet, Dakar, Senegal



BecANET, Nairobi, Kenya



SANBio, Pretoria, South Africa



Priority Areas

Food security; nutrition, healthcare, & environmental sustainability.

Centre Focus:

BecANet: Animal biotech

(Central Africa- Forest technology)

SANBio: Health biotech

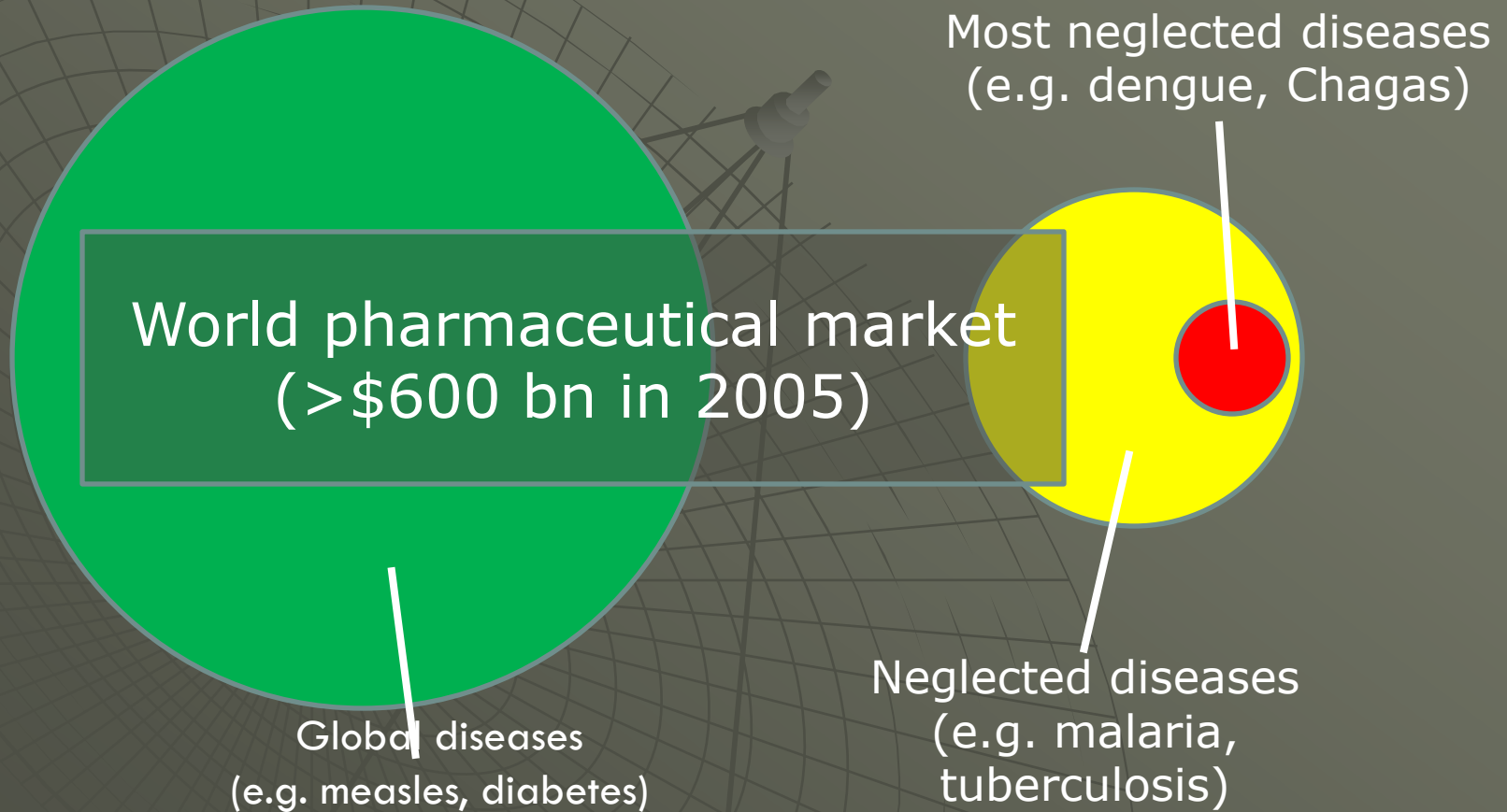
WABNet: Crop biotech

NABNet: Bio-pharmaceuticals

The Neglected Capacity of developing Countries to Address Neglected Diseases

- ◆ The interface of science, technology transfer & access
- ◆ Partnerships in promoting innovation & managing risk
- ◆ Managing IP for health & agric innovation
- ◆ Financing for innovation & tech transfer

Global, neglected and most neglected diseases (WHO & MSF)



A Portrait of Sub-Saharan Africa

A poll conducted in Spring 2007 by The New York Times and the Pew Global Attitudes Project surveyed public opinion in 10 sub-Saharan African countries.

NATIONAL ISSUES

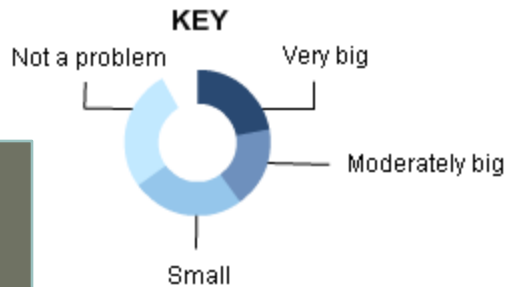
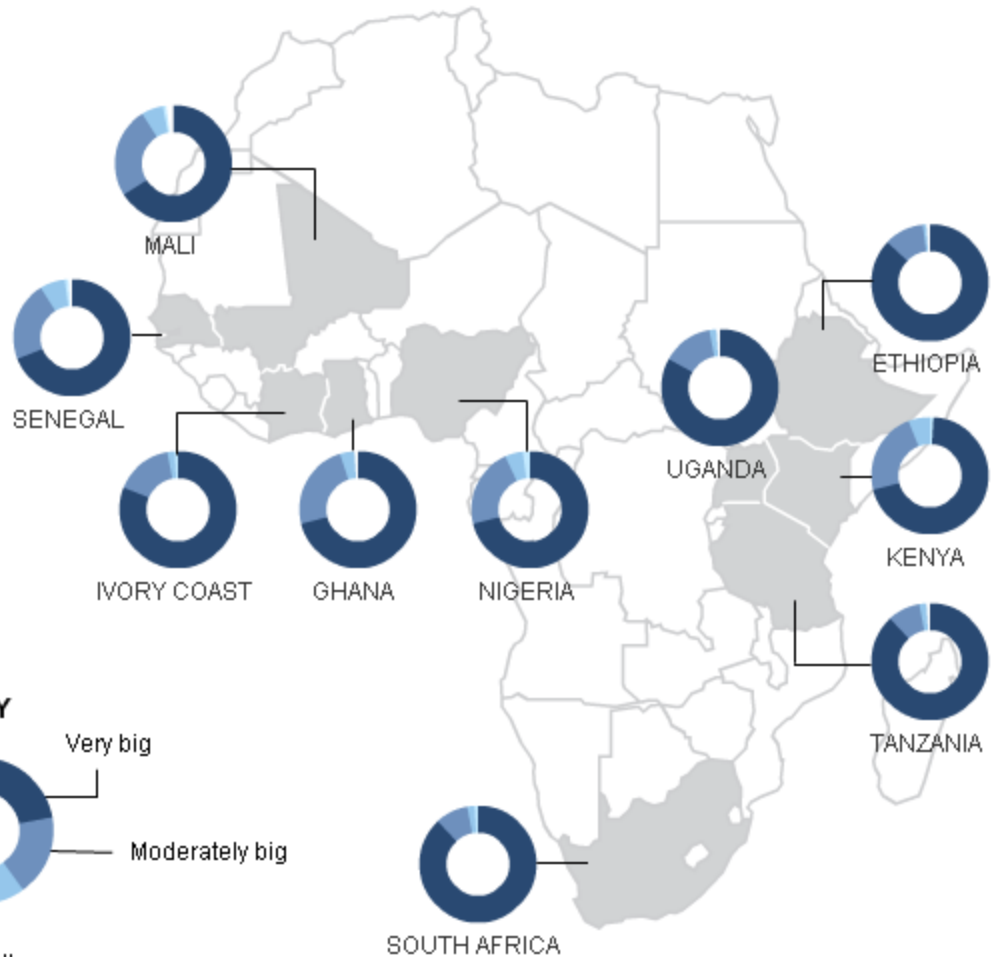
ECONOMY AND PERSONAL WELL-BEING

INTERNATIONAL VIEWS

National issues

How severe are the following problems in your country?

- Crime
- Terrorism
- Ethnic/religious conflict
- Corrupt political leaders
- Poor schools
- Immigration
- Job flight
- Illegal drugs**
- HIV/AIDS and other diseases
- Poor drinking water
- Pollution



Public opinion sees illegal drugs as a major problem all over

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Economy

How would you describe the current economic situation in your country?

How are you and your family doing financially today, compared with five years ago?

When children today grow up, do you think they will be better off or worse than people today?

Health and Well-Being

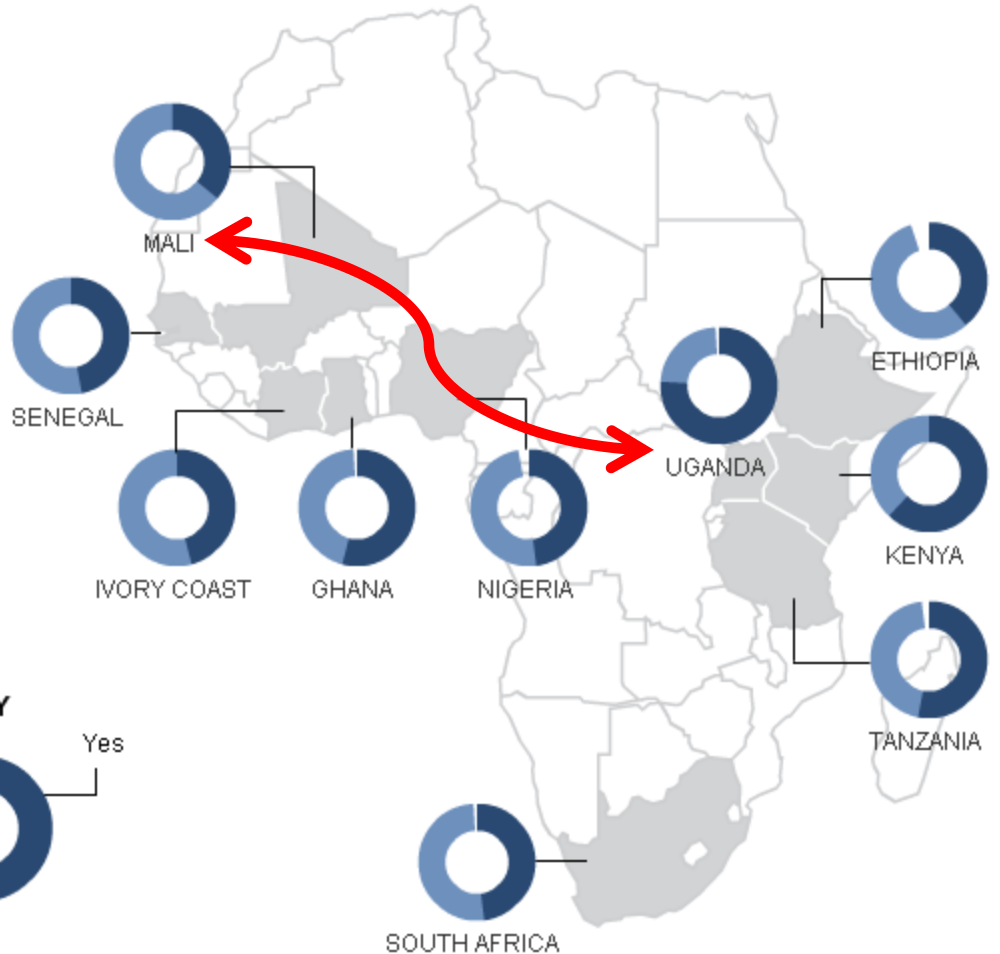
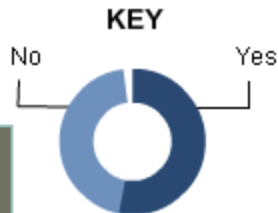
Would you be willing to take an HIV test, or have you already taken an HIV test?

Have there been times during the last year when you did not have enough money...

...to buy food your family needed?

...to pay for medical and health care your family needed?

...to buy clothing your family needed?



On the other hand the need to pay for medical and health care seems to vary among countries (e.g. Uganda x Mali)

Neglected tropical diseases

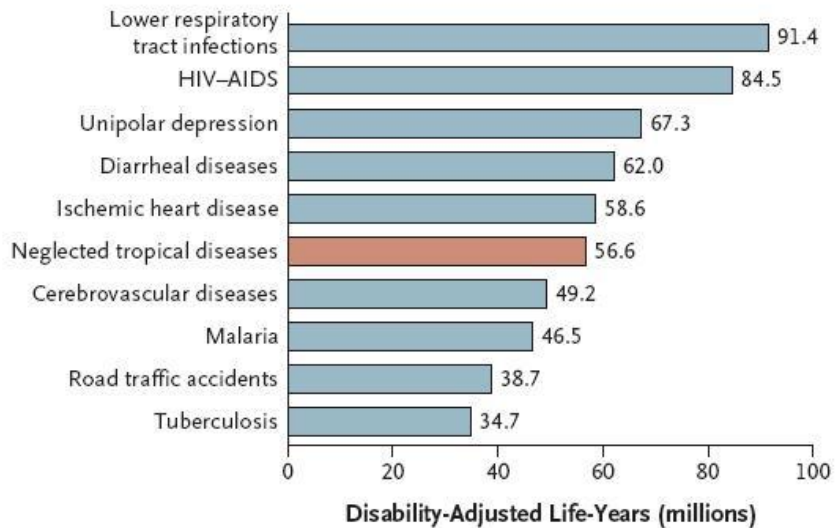


Figure 1. The 10 Leading Causes of Life-Years Lost to Disability and Premature Death.

The number of years lost to disability and premature death (disability-adjusted life-years) for the 13 major neglected tropical diseases were calculated according to a method we described previously.⁴ The disability-adjusted life-years for the other conditions are based on data from the World Health Organization.²³ The ranking of disease burdens is based on data in Hotez.⁵

"The neglected tropical diseases are a group of 13 major disabling conditions that are among the most common chronic infections in the

Components of health innovation

- ◆ R&D (i.e. laboratory & clinical studies)
- ◆ Regulations for safety and efficacy
- ◆ Manufacturing capabilities to meet international quality standards
- ◆ Authoritative IP management & licensing
- ◆ Delivery of immunization services by national & private sectors
- ◆ International procurement & trade

Two essential elements for success: dynamic linkage & partnerships

Efforts: How sufficient and how sustainable?

- ◆ Health Innovation Networks to help dev'g countries address neglected diseases. *e.g. Developing Country Vaccine Manufactures Network; WHO Developing Countries' Vaccine Regulator Network.*
- ◆ Dev'g countries need to move up the Public expenditure ladder; *e.g. Developed countries average \$2,500/capital (2003) cf \$150 to \$10/capital in developing countries.*
- ◆ Technological & social innovation: Dev'g countries need R&D partnerships & implementation research networks to play a more prominent role in global health (Gardner et al., 2007)
- ◆ Dev'g countries need to concentrate on areas of comparative adv for +ve growth; *e.g. traditional health systems, areas that will yield the greatest returns. (Pareto's Law)*

Types of global health partnerships

There is today a large number of global health PPPs focusing on neglected and most neglected diseases. They are quite different in terms of vision and goals.

- ◆ Partnerships focusing at reducing financial risks of drug development; e.g. TB Alliance
- ◆ Partnerships focusing on public health and capacity building of endemic countries; e.g.
 - UN Special Programmes (HRP; TDR)
 - Developing Country Vaccine Manufacturers' Network
- ◆ Partnerships addressing both goals

Biotech Funding: South Africa Scenario

- GDP US\$ 11,400
- Formal R&D Expenditure 0.87%
- Companies contribution 1.8% sales revenue
- Knowledge economy: key ingredient innovation- capacity to innovate internally and absorb external innovation with impact on the economy and society.

Developed new mechanisms for public funding of R&D

- Technology and Human Resources for Industry Programme (THRIP)
- 'Technology push': 3 BRICs of \$240 million/year
- HSRC's Centre for Science Technology & Innovation Indicators in collaboration with NRF, NACI, & CHE to provide strategic intelligence and analysis to support policy.

Source: OECD- Review of the South Africa's Innovation Policy (2007)

Biotech Funding: Sub-Saharan Africa Countries Scenario

- Gross expenditure on R&D less than 0.3% (some 0%)
- International donors provide 75% of R&D budgets
- Bilateral Donors: ***EU, DFID, USAID, DANIDA, GTZ, SIDA, CIDA, etc***
- Foundations: ***Rockefeller Foundation, BMGF, Gatsby Trust Foundation, IFS, KirkHouse Trust (AATF for Agric Biotech Research and Training in Africa)***
- ***World Bank***
- ***Africa Development Bank***
- ***Others: IDRC, IFAD, MAE (France), CTA, etc***

Political will vs. Financial Commitments

- ◆ Political will for biotech is in Africa but no fund to support the knowledge-based development.
- ◆ Funding is less than \$250,000/year in most AU countries.

AMCOST developing legal instruments for African Science & Innovation Facility (ASIF) a distinct funding scheme for S&T in Africa in partnership with AU-NEPAD, ADB, and WB.

Other sources/possible sources of fund for R&D

AU : Maputo Declaration 10% of Agric GDP to R&D

AMCOST: 1% of GDP to S&T

Others:

- ◆ Agro-industry-wide levies e. g. Kenya small charge on tea, coffee and sugar.
- ◆ Gains from National Lotteries.
- ◆ Restructuring and Redefining public expenditure to cater for S&T Research.
- ◆ Banking & financial reforms to promote technological innovations.
- ◆ Capital markets through Venture Capitals.

Conclusions

- ◆ With NEPAD, it is '**business unusual**'
- ◆ *Universities & Research Inst. in the AU need to be re-invented for innovations and PPP; piecemeal change will not do.*
- ◆ *AU leaders must significantly increase public investments in biotech R&D. Failure to do so will impair the continents' capacity to stay connected to global advances in biotech and to transfer, adapt and exploit life sciences knowledge for the benefit of all citizens.*
- ◆ *Regional approach to disease control be adopted.*

(AU-NEPAD Doc. Freedom to Innovate, 2007)