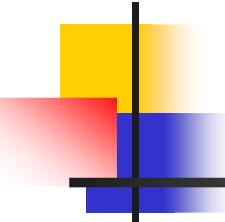


Impact of the Global Financial Crisis on Sustainability

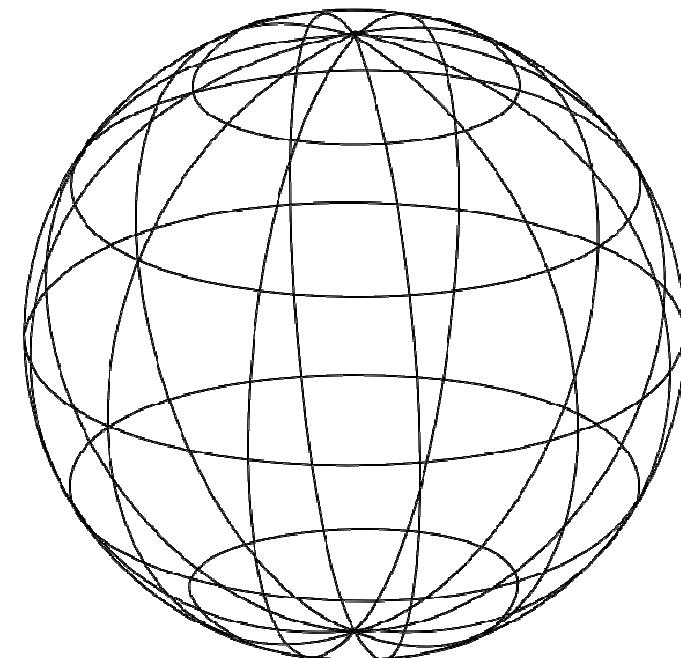
Mohamed H.A. Hassan
Executive Director, TWAS
President, AAS

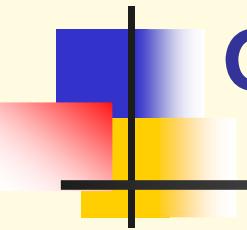
Roundtable on S&T for Sustainability, Washington, DC, 1-2 April 2009



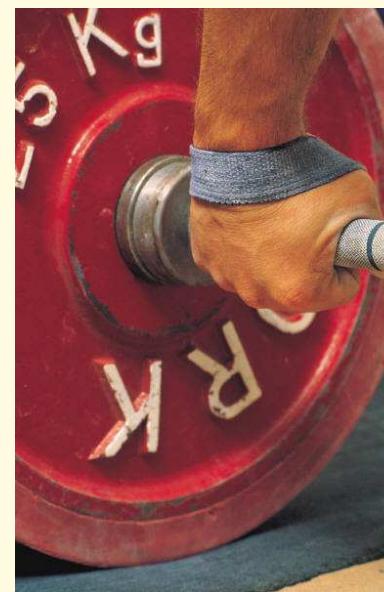
Outline

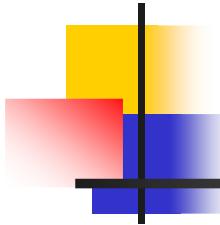
- Global Challenges
- Global Opportunities
- Global Action





Global Challenges





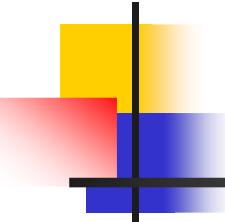
Global Challenges

WSSD (2002)

- Water
- Energy
- Health
- Agriculture
- Biodiversity

Climate Change Financial Crisis

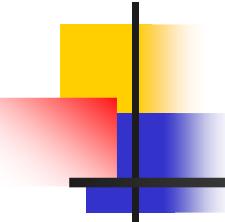




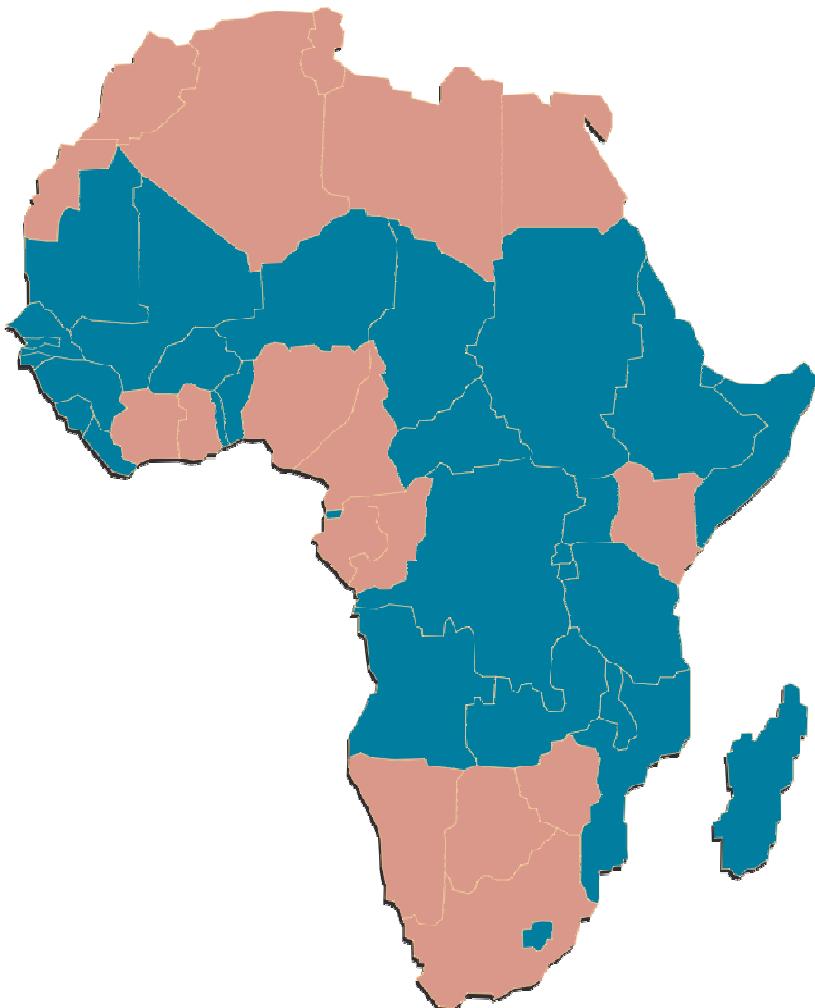
Global Challenges

- Inter-related and complex
- Increasingly global
- Most severe and challenging in Africa

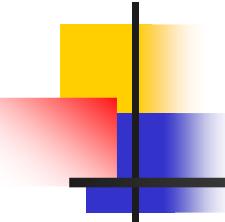




African Facts and Figures



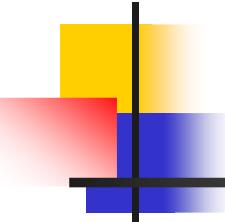
- 33 of the world's 49 least developed countries are African countries
- 70% of all Africans live on less than \$2 a day
- 26.5 million Africans are infected with HIV, and 2.5 million die each year of AIDS
- 73% of Africans do not have electricity
- Nearly 1 million Africans are killed by malaria each year
- 42% of Africans have no access to safe drinking water



Climate Change

- Africa is most vulnerable to climate change because of its fragile ecosystem
- Global warming will most likely increase sand and dust movement in Africa's arid lands

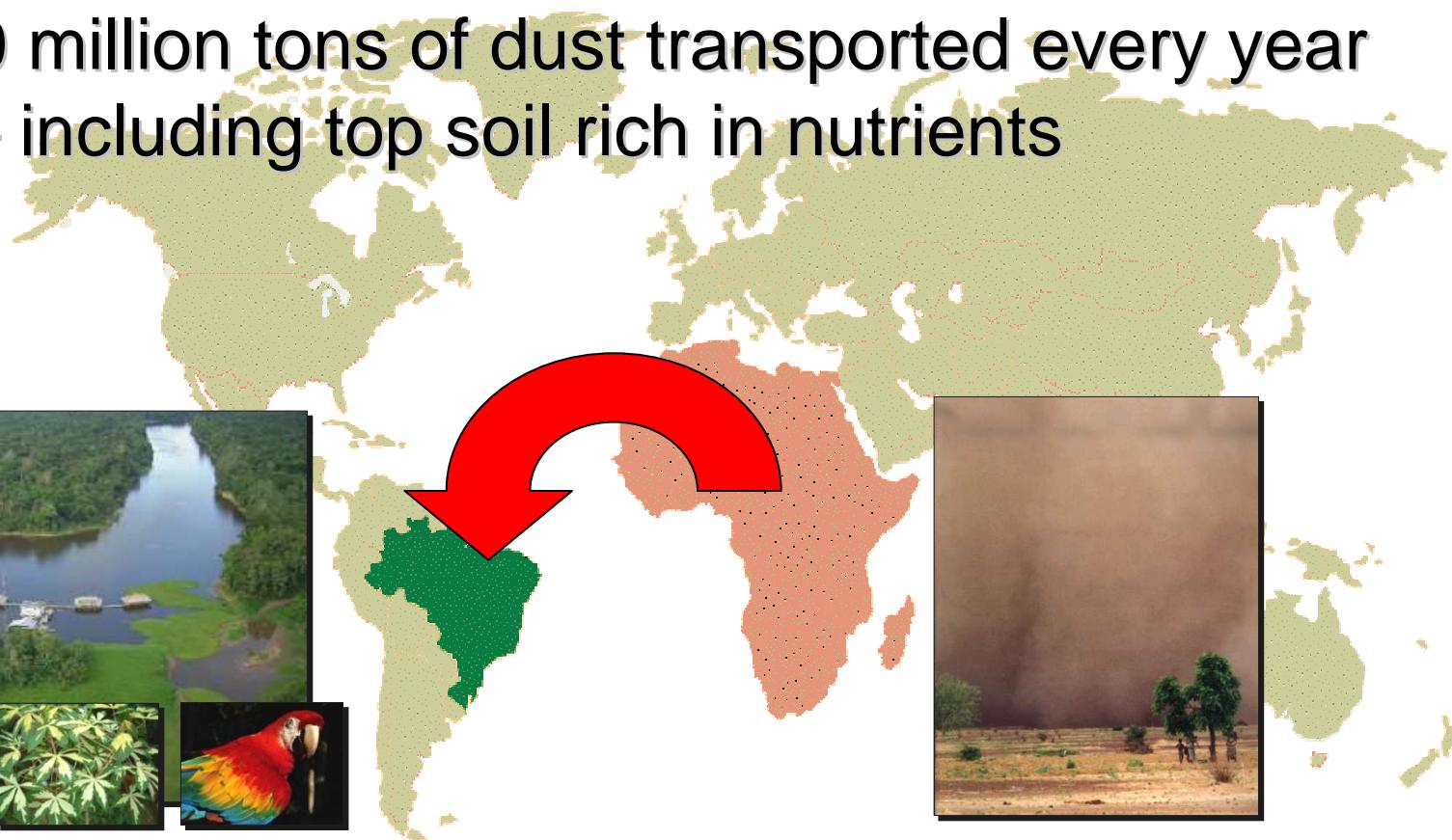


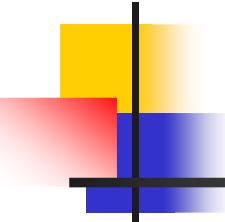


Climate Change

Africa's “exports”

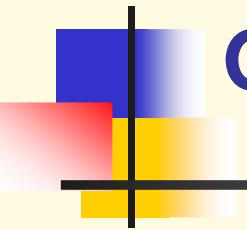
50 million tons of dust transported every year
— including top soil rich in nutrients





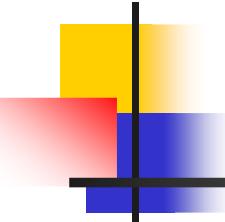
Global Financial Crisis

- Worldwide GDP decline may result in less internal and external funding for education, research and capacity to solve sustainability problems. Education and Research often hit first
- Poorest nations most vulnerable to impact of global financial crisis
- Lessons from previous mistakes (economic crisis in Africa, 1980s)
- Biggest challenge for poor nations: how to respond to crisis



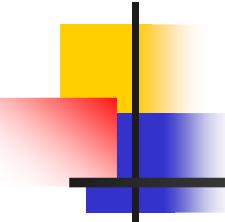
Global Opportunities





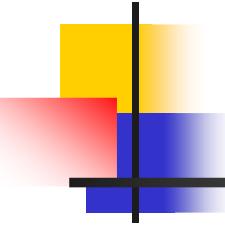
Global Opportunities

- More understanding of centrality of STI in addressing sustainability problems and sustained economic recovery
- Opportunity to invest out of the Crisis in quality education, research and innovation in sustainability problems — to develop green technologies, create green jobs and accelerate green growth

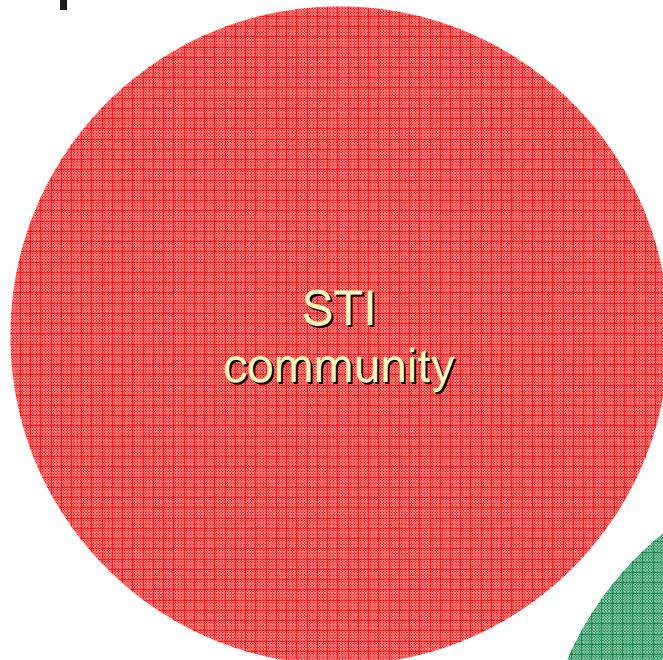


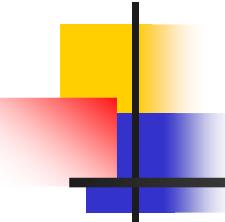
Global Opportunities

- Global economic stimulus packages based on new Contracts between S&T community, development community and finance community (government ; private)

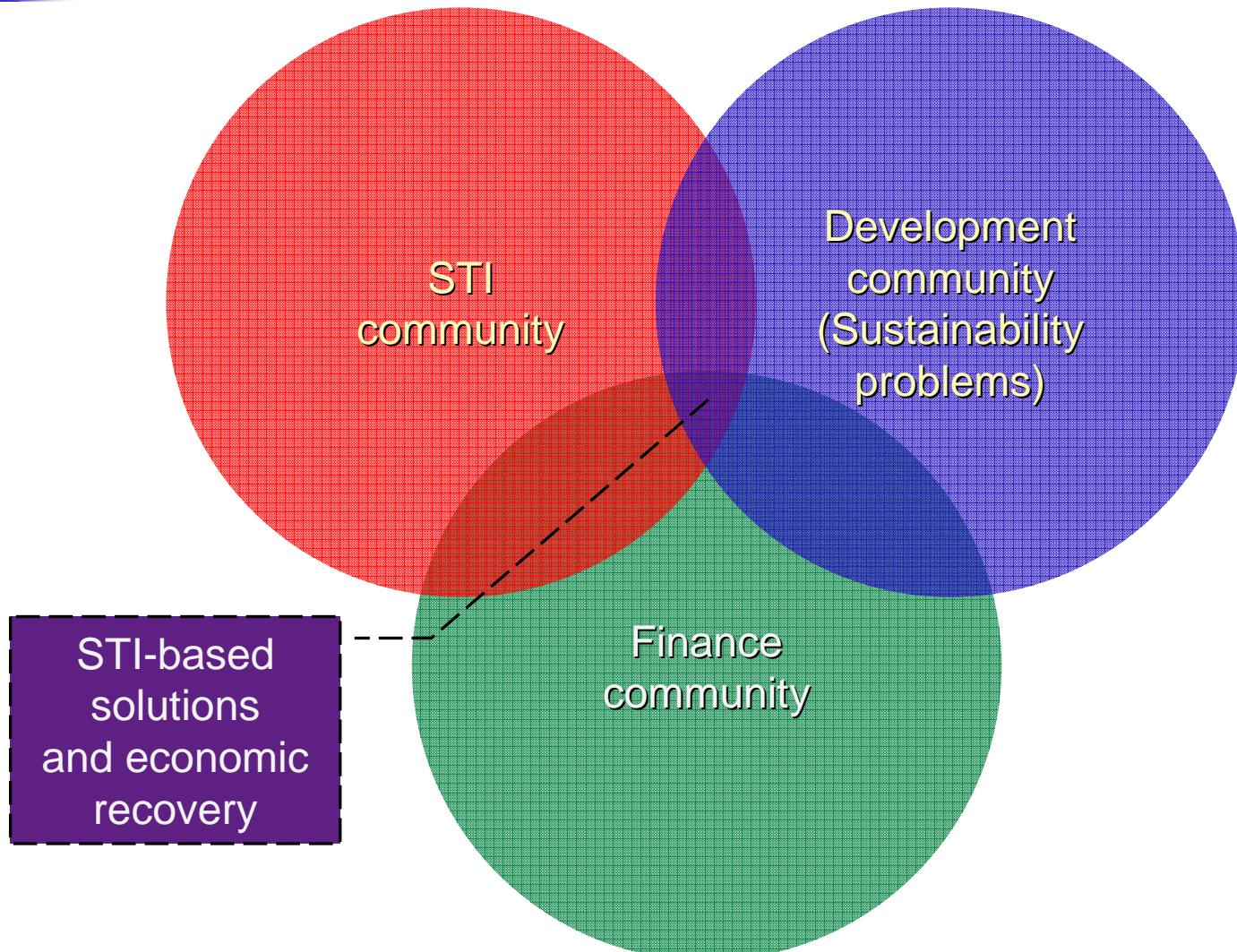


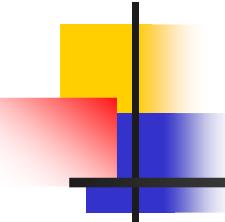
Global Opportunities





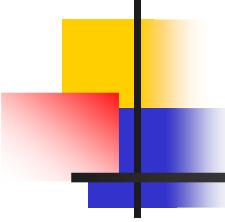
Global Opportunities





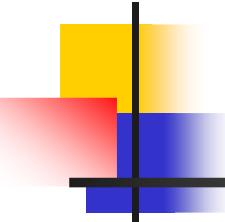
Global Opportunities

- Leadership role of US and China: More investment in STI, especially renewable energies and low-carbon technologies
(US: 2.5% of stimulus package for STI, amounting to US\$21 billion)
- More investment in frontier science and new technologies



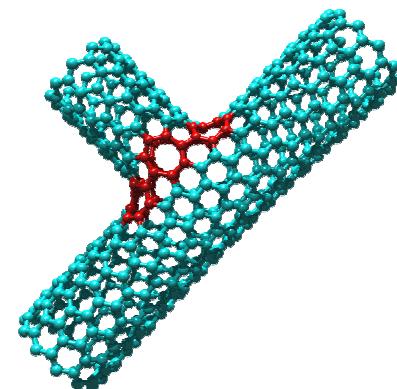
Frontier science and new technologies

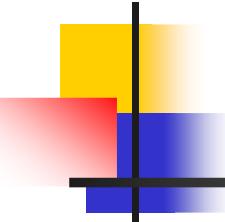
- New fields of science and cutting-edge technologies have important applications to global sustainability problems
- They have the potential of transforming the lives of poor communities in the developing countries



Frontier science and new technologies

- Nanotechnology is about manipulating matter at the atomic scale (*1 nanometre = 10^{-9} metre*)
- Transformative technology: Impact could be greater than
 - Steam engine in 18th century
 - Electricity in 20th century
 - ICTs (Internet) in recent years
- Promises new generation of materials with applications to critical problems



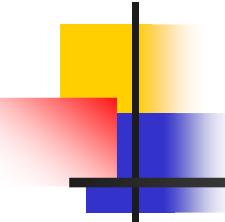


Application: Water purification

- Nanotechnology has the potential to provide inexpensive decentralized and efficient water purification filters that detect molecule-size contaminants

Pleated nanofilters in principle work like the several layers of sari-cloth that are used for water filtering in Bangladesh



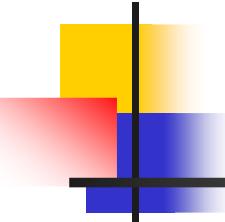


Application: Water purification

- Nanomembrane filters made of carbon nanotubes are used to block bacteria and viruses and can withstand relatively high temperatures

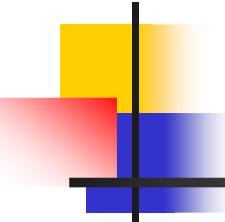


Oxen-driven water pump equipped with nanofilters in India



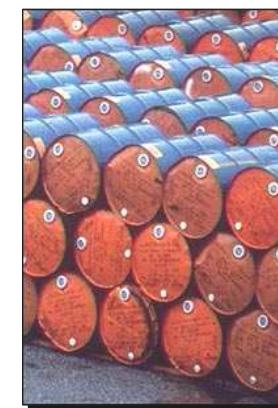
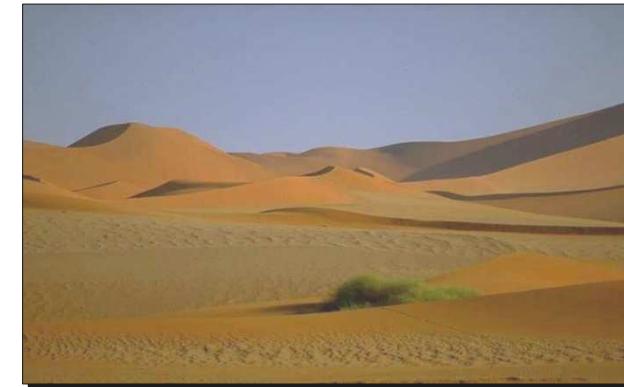
Application: Solar energy

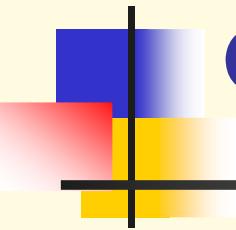
- Solar energy market increasing by 40% every year; expected to grow from US\$13 billion to US\$32 billion by 2012
- Nanotechnology promises to provide a new generation of nanosolar cells much cheaper and more efficient than current solar cells based on silicon
- Thin-film solar panels coated with nanoparticle sheets (*rolling off machines like pages of newspapers at a rate of several hundred sheets per minute*) promise to reduce production costs to US\$1 per Watt



Clean energy from African deserts

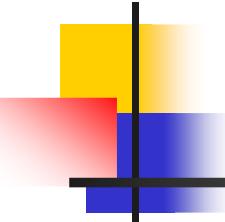
- Solar power plants in North Africa could supply Europe with vast quantities of energy
- Each square kilometre of African desert every year receives solar energy equivalent to 1.5 million barrels of oil
- Less than 1% of the world's hottest deserts could produce electricity equivalent to the current world consumption
- Solar energy received by deserts worldwide is nearly 1,000 times the entire annual energy consumption of the world





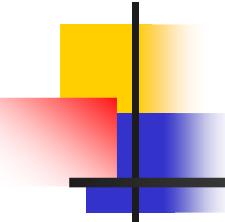
Global Action





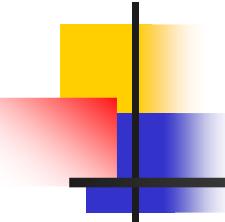
Global Action

- All nations should sustain and increase investment in education, research and innovation (especially clean technologies)
 - Ensure that STI are included in economic stimulus packages
 - Follow examples of US and China



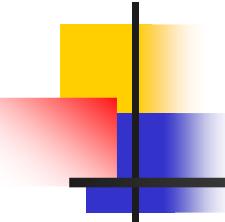
Global Action

- Rich nations to fulfill previous promises of investment in Africa's infrastructure, education and research systems to avert global sustainability crisis
 - US\$60 billion promised in 2005 (US\$8 billion for education and research)
 - Contrast: US\$4 trillion spent in last few months on financial bailouts and stimulus packages
- Benefits: Promote development in poor nations stimulates industry in rich nations and promotes global sustainability



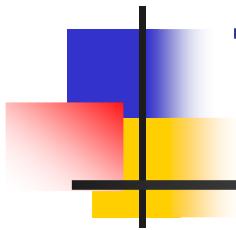
Global Action

- International scientific community under leadership of science academies to provide credible, evidence-based advice on importance of maintaining research budgets during economic recession
 - IAP/EC last week decided to issue joint policy statement to be signed by all 100 member academies on development and utilization of STI to accelerate sustainable economic growth and financial recovery worldwide



Important forthcoming events

- **Forum on Energy and Climate**
Washington, USA, April 2009
- **UN-CSD**
New York, USA, May 2009
- **G8+5 meeting**
La Maddalena, Italy, July 2009
- **Climate Change Conference**
Copenhagen, Denmark, December 2009



Thank you

Mohamed H.A. Hassan
Executive Director, TWAS, Trieste
President, AAS, Nairobi
mhassan@twas.org