

S&T for Global Development: are we tackling the right issues?

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Introduction

- At an early stage of preparation of the September 2008 conference, focus was set on the contribution of S&T to the achievement of Millennium Development Goals. Background paper currently available
 - Some evolution in program due to stronger involvement of CGIAR, agricultural emphasis welcomed in view of current acute food crisis
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S&T and Millennium Development Goals (1)

- **Eradicate extreme poverty and hunger**
 - **Achieve universal primary education**
 - **Promote gender equality and empower women**
 - **Reduce child mortality**
 - **Improve maternal health**
 - **Combat HIV/AIDS, malaria and other diseases**
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S&T and Millennium Development Goals (2)

- **Ensure environmental sustainability (loss of environmental resources, access to safe drinking water, rehabilitation of slums)**
 - **Develop a global partnership for development (open trade, financial system, work for youth, access to pharmaceutical drugs and to ICTs)**
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S&T and Millennium Development Goals (3)

The main contributions from S&T are in the following sectors:

- ❑ Health: diagnostics, early warning, prevention, treatment
 - ❑ Education: information and communication technologies
 - ❑ Nutrition: agricultural techniques, water management
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S&T and Millennium Development Goals (4)

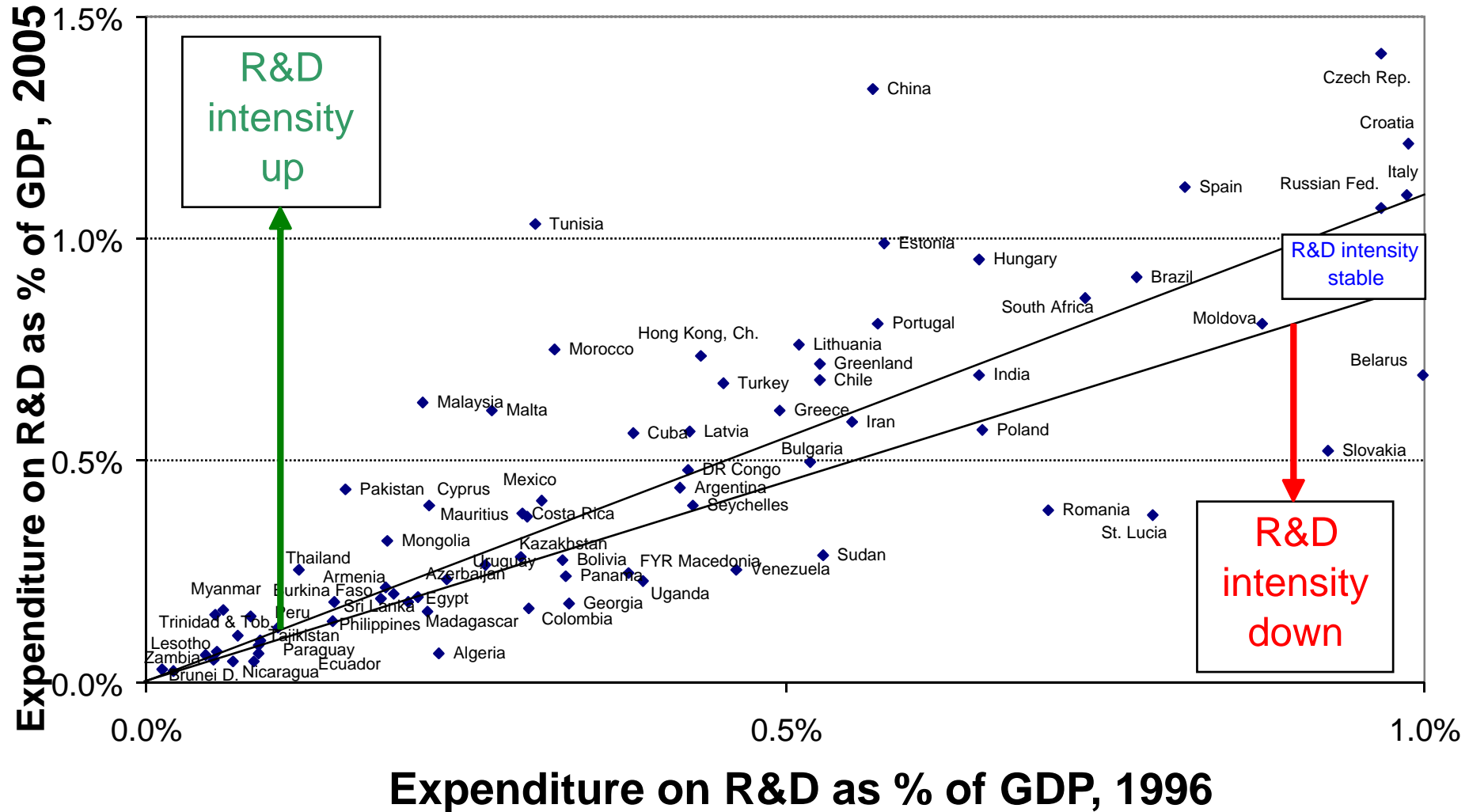
- Environment: waste management, pollution abatement, urban management, risk management

In addition, one horizontal dimension
i.e. energy supply

An addition to the program

- Addition of statistical aspects is welcomed as developing countries are poorly treated in terms of knowledge indicators in spite of UNESCO (S. Ellis, E. Martinez) efforts, notably for the adaptation of the OECD Frascati manual for S&T indicators to the situation of LDCs
 - Increasing role of regional organizations such as OIC in this field
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GERD as a percentage of GDP (R&D intensity), 1996 (or earliest available year) and 2005 (or latest available year).
 Countries with R&D intensity below 1.5% in 2005



New considerations (1)

- Recent events lead to proposing addition of some new considerations which could be reflected in the Resolution of the Conference
 - The need for a more holistic approach requiring in-depth system studies
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New considerations (2)

- The issue of maintaining in LDCs enough human resources for S&T related activities
 - The problem of generating enough financial resources for coping with all the pressing needs of this World
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The need for a holistic approach

- Too often S&T and innovation work is driven by a well focused demand, shifting according to short term political priorities, without investigating the collateral effects of the results of such work. Overall system assessment is lacking in the most cases. This is illustrated by a few examples
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Photovoltaic Cells and Waste

- There is an increased world demand for polysilicon destined for photovoltaic cells. Silicon tetrachloride, the byproduct of polysilicon production, is highly toxic. Its recycling through a high temperature process (1000°C) exists but is not applied in China, the largest producer, for saving time and money. It leads to a planned ecological disaster, notably in the Henan province. Clean energy in the developed world and waste elsewhere?
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Energy Saving Light Bulbs and Hazardous Waste

- Compact fluorescent light bulbs are extremely energy-efficient but they all contain Mercury, causing kidney and brain damage. The amount per bulb is 5 mg Hg, enough to contaminate 24 000 liters of water beyond safe drinking levels. Energy savings or environmental protection? Who chooses?
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The folly of 1st Generation Biofuels (1)

- There is a radical rise in food prices, about 40% in 2007 (recently 30% in two weeks for rice). Causes are multiple:
 - Increased demand: demography, standard of living
 - Urbanization
 - Climate change: droughts, floods
 - Energy demand: biofuels, fertilizers
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The folly of 1st Generation Biofuels (2)

Biofuels raise the basic issue of the utilization of land either for food or for energy: as an example, 50 liters of ethanol (250 km with a SUV) require 200 kg of maize (1 year of food for one person in developing countries)

Also, in certain cases, a positive energy balance is not guaranteed

The folly of 1st Generation Biofuels (3)

An example of the pressure on arable land: Virgin Atlantic and other airlines testing biofuels for their flights:

One return flight London/New York consumes 170 000 liters of fuel. With two flights a day, this means about 122 millions liters of fuel each year; one m² of arable land can produce 0.05 l of biofuel in US/European conditions per year. Hence, fueling only two transatlantic flights a day during a year would require about 2500 km² of cultivated land under good production conditions!

The folly of 1st Generation Biofuels (4)

- ↕ The future of biomass as an energy source depends very much from the possibility in the future to produce biofuels from waste (e.g. wooden chips) or from crops grown on marginal land (e.g. jatropha in India, miscanthus in Britain) or from algae
 - ↕ 2nd generation biofuels are good themes for further S&T work
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Maintaining S&T human resources in LDCs (1)

- More than a problem of capacity building, the issue is to stabilize and maintain this capacity in countries with political instability and/or reduced financial means
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Maintaining S&T human resources in LDCs (2)

- Three elements of answer to this challenge have to be promoted:
 - The presence of good Universities; Universities constitute the backbone of any S&T system
 - The continued assistance of S&T-advanced and S&T-proficient countries beyond capacity building, through effective networking based on sustainability plans
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Maintaining S&T human resources in LDCs (3)

- A policy favoring the stabilization of the scientific elites in the country itself for the execution of scientific work. This means financial advantages, special working conditions, possibilities for short term stays abroad and the presence of challenging research work sponsored by the public and private sectors
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Identifying adequate financial resources (1)

- Achieving the Millennium Development Goals is hampered by the lack of funding. A plausible level of overall ODA for the MDGs should be 135 Billion\$ in 2006 increasing to 195 Billion\$ in 2015, including co-financing and “graduation”. These figures have to be compared to the overall level of ODA
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Identifying adequate financial resources (2)

- According to the OECD report published April 4, 2008, Overseas Development Aid (ODA) has decreased by 8.4% in constant dollars from 2006 to 2007 with 15% reduction for France, 29.1% for United Kingdom, 30.1% for Japan, 11.2% for Belgium, 9.9% for the United States, 3% for the EU, somewhat balanced by Spain +33.8%, Norway +13.4%, Luxemburg +11.7%, Austria +7.6% and Germany 5.9%
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Identifying adequate financial resources (3)

- Total ODA from OECD countries was 103.6 Billion\$ in 2007, compared to 104.4 in 2006 and 106.7 in 2005. This reduction is slightly compensated by India's pledge to double its assistance to African countries which was 2.15 Billion\$ over the last 5 years
 - This total ODA does not even cover currently the MDGs needs
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Identifying adequate financial resources (4)

- At the same time, large investments are required for equally useful purposes, notably in the energy sector. The total investment requirement for energy supply infrastructure over the period 2001-2030 is over 16 Trillions US\$ for expanding supply capacity and replacing existing or future supply facilities
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Identifying adequate financial resources (5)

- This energy investment requirement corresponds to 1% of global GDP and 4.5% of all investments (IEA World Energy Investment Outlook 2003 Insights). For Africa, it means allocating 4% of its GDP to this sole purpose. The alternative for Africa is the continuation of power outages which cost African economies as much as 2% of their GDP (The Wall Street Journal, April 18, 2008)
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Identifying adequate financial resources (6)

- Mobilizing the investment depends on the ability of the energy sector to compete against other sectors of the economy for capital. The electricity sector alone needs about 10 Trillions US\$, 60% of the total energy investment. Half of the energy investment will have to take place in the developing world
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Identifying adequate financial resources (7)

- What about adaptation to, and mitigation of, climate change effects? They require also new investments amounting again to hundreds of billions of \$. Even if the long term impact of such investments will be fairly moderate, i.e. a slowdown of about 0.1% in the average annual growth of global GDP, money has to be found for the required work, notably for LDCs
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Identifying adequate financial resources (8)

- Defining the right priorities for financing required investments will be a difficult exercise. One can only hope that the Millennium Development Goals will not be sacrificed to the benefit of more politically visible operations
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In conclusion

Science and Technology remain essential components for reaching a sustainable global development. In conducting S&T activities, it is mandatory to follow a truly holistic approach; comprehensive system studies, sound management of human resources, right priorities in financial investments are part of such approach
