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The Need for an ACP-EU Policy Dialogue on Science and Technology for Development in ACP Countries

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The much publicized innovations associated with 'new technologies' - biotechnology, biomedical technology, materials science, energy technologies and information and communication technologies (ICTs) - have rekindled interest in the potential of science and technology (S&T) for accelerating the process of economic development among development policy makers. The UNDP persuasively summarized this new mood in its Human Development Report 2001 as follows: 'if the development community continues to ignore the explosion of technological innovation in food, medicine and information, it risks marginalizing itself and denying developing countries opportunities that, if harnessed effectively, could transform the lives of poor people and offer breakthrough development opportunities to poor countries'.[1] Such a challenge is enormous and can only be achieved on the basis of an open, ongoing policy dialogue among all actors who have a stake in improving the technological vitality of developing countries.

The extent of the technological divide

If developing and industrialized economies were identical save for purchasing power, the current barriers to the global spread of technological innovations would be easy to surmount. First, however, a technological divide between high- and low-income countries has to be bridged. This divide is attributable to an intricate web of interrelated factors pertaining to the generation and diffusion of technological innovations as well as the conditions for, and process of, developing and nurturing innovation. The extent of the divide can be ascertained by looking at the availability and quality of (1) human capital (level of education, health, etc.); (2) financial resources devoted to developing and maintaining the RTD infrastructure and capacity; and (3) computing power and the extent of networking and dialogue within local and international RTD communities. Table 1 provides an overview of the current situation with regard to these selected indicators. It compares the 58 low-income countries (LICs) with the 33 high-income countries (HICs).

S&T for development is dependent on the existence of well established educational institutions, reliable ICT and energy infrastructures, as well as dependable political, financial and legal (property rights) systems. The comparative overview provides useful and alarming insights into the current status of S&T in developing countries. To any seasoned observer it is obvious that improving their technological vitality is a multi-faceted task that requires nothing less than a transformation of these countries' 'fabric of S&T for development'.

Public-private partnerships in S&T

Funds for public S&T in developing countries have declined dramatically over the past 25 years. It is often claimed that in OECD countries public-private partnerships have successfully compensated for such declining public funding. Developing countries are being told that they should learn from these experiences and pursue the opportunities such partnerships offer. However, this claim should be examined carefully. First, the phenomenon of public-private partnerships in S&T is peculiar to the OECD countries. Second, only 12% of corporate research funding goes to farm-level technologies; most of it goes to food processing and post-harvest research, illustrating the reality that, by and large, farm-based research still depends on public funding while private research has tended to be factory-based. For all practical purposes, that public-private partnerships can bridge the technology divide

is a dream still held only by over-optimistic bureaucrats within development agencies.

Discrepancy between the world's research agenda and research needs

With few exceptions, advances in S&T for development still take place exclusively in high-income countries according the research priorities that are dictated by the market in those countries. In fact, the technological divide has resulted in a marked discrepancy between the world's research agenda and the research needs of low-income countries. In high-income countries, the agricultural research budget of a private company such as Monsanto is in excess of USD 10 billion. Yet the 16 tropical research institutes that form the Consultative Group for International Agricultural Research (CGIAR) and which address the needs of the low-income countries, have been unable to raise the USD 400 million needed to implement their annual research agenda for the period 2000-2010.[2] In a similar vein, global spending on medical research in 1998 was USD 70 billion, of which less than 10% was devoted to research into the health problems that affect 90% of the world's population. In the mid-1990s, the direct and indirect costs of malaria, one of the leading causes of sickness and death in the developing world, have been estimated at USD 2 billion per annum, yet a meagre USD 100 million per year was dedicated to malaria research.[3]

Developing countries urgently require their own, *locally contextualized* applications of the new technologies originating in the North[4], and need to mobilize and strengthen their own S&T infrastructures and capabilities to address their development problems from their own policy perspectives. Since the mid-1990s, governments of developing countries such as South Africa[5], Vietnam[6] or Ghana,[7] together with international organizations such as the World Bank and UNDP, have put 'knowledge as key to socio-economic development' on the political agenda. They have begun the search for knowledge and innovation systems that would enable economies to:

Table 1:The technological divide between high- and low-income countries.

Selected indicators	Year	Unit/measure	HICs	LICs	LIC/HIC (%)
Human capital indicators					
Human Development Index (HDI)	1999		0.926	0.549	59
GDP per capita	1999	PPP[a] in USD	25,860	1,910	7
Population under age 15	1999	%	18.6	37.2	200
Annual population growth 1999-2015	1999	%	0.4	1.7	425
Infant (under five) mortality rate	1999	per 1,000 births	6	120	2,000
Life expectancy at birth	1999	Years	78	59	76
Primary, secondary, tertiary enrolment	1999	%	93	51	55
Adult literacy rate (male and female)	1999	% age 15+	(99)	61.7	62
Adult literacy rate (female only)	1999	% age 15+	(99)	52.2	53
Resources indicators					
Total GNP[b]	1997	USD billion	23,802	722	3
R&D expenditures 1987-97[c]		% of GNP	2.4	0.9	38
Total R&D expenditures	1997	USD billion	571	6	1
Scientists/engineers in R&D 1987-97[c]		per 100,000 peole	3,127	47[d]	2
Patent applications filed	1997	*1,000	2,137	16[e]	1
High-technology exports	1998	% goods exported	21	4	19
Computing power and networking indicators					
Telephone main lines	1999	per 1,000 people	591	27	5
Cellular mobile subscribers	1999	per 1,000 people	373	3	1
Personal computers	1999	per 1,000 people	311	3	1
Internet hosts	1999	per 1,000 people	95.2	0.1	0
Electricity consumption	1998	Kilowatt-hours	8,406	362	4

[a]PPP = purchasing power parity, in US$. [b]GNP 1997, Atlas method (www.lefo.ro/iwlearn/pdf/gnp.pdf). [c]Data refer to the most recent year available. [d]Based on data available from 11 countries. [e]Applications filed by residents only.

Source: UNDP (2001) *Human Development Report 2001.*

- systematically identify and facilitate innovations arising in various (usually non-formalized/scientific) sectors of their domestic economies; and
- import where appropriate, and adapt, as a matter of routine, scientific discoveries and innovations made outside their domestic economies.

The European Commission's initiative to start a policy dialogue on RTD

In the late 1990s, the European Commission also turned its attention to supporting the mobilization and reform of S&T, or, as the Commission preferred to call it, Research and Technology for Development (RTD),[8] infrastructures and capabilities in developing countries. In 1997, a new RTD programme support policy[9] was adopted, later (in March 1999) endorsed by the European Parliament[10] and the ACP-EU Assembly[11] (in April 1999). In this RTD programme, the Commission opted for two lines of action:

- supporting RTD policy reform and capacity building with special attention to 'creating a facilitating environment for science and higher education, including universities' in the 77 African, Caribbean and Pacific (ACP) countries with which the EU collaborates under the Cotonou Agreement; and
- strengthening research collaboration between the European scientific community and its partners in developing countries.

In pursuit of these intentions, the Commission initiated *a dialogue on RTD policy reform **in ACP countries*** between the Commission, EU Member States and ACP countries. It determined that a number of policy issues required further consideration and that a wide range of actors should be involved. This policy dialogue on RTD was to focus on four principal challenges:

- the development of appropriate national RTD policies in ACP countries, to address their inadequate and often inappropriate research capacity;
- the formulation of strategies for supporting institutional reforms of RTD infrastructure and for strengthening the national RTD capacities in ACP countries;
- the intensification of scientific cooperation at national, regional and international levels; and
  the identification of innovative funding mechanisms to develop and sustain appropriate RTD infrastructure in developing countries

Developing a framework for the policy dialogue on RTD

In the past, or to be fair, perhaps at any time, constructive policy dialogue involving the wide range of interests and expertise - policy makers and RTD practitioners, captains of industry and end-users - has proven to be elusive. The Commission's DG Development, with funds from the Netherlands government, assigned to the European Centre for Development Policy Management (ECDPM, Maastricht) the task of developing a framework for the policy dialogue on RTD.[12] This framework ought to establish the environment for *energizing and articulating* the knowledge and expertise that exists among the wide range of RTD stakeholders. This framework was to address three components of any ACP-EU policy dialogue: (i) a national RTD policy dialogue in ACP countries; (ii) bilateral consultations between the governments of ACP countries and the Commission; and (iii) 'multilateral' ACP-EU policy discussions on RTD.

Issues Requiring Further Consideration

The Commission recognized a number of issues that required further consideration, including the following:

- the inadequate policy framework for RTD in developing countries, which has muted the impact of dispersed, often excellent RTD work;
- insufficient involvement of technology end-users and civil society organizations in setting RTD policy priorities, with the result that projects are perceived as being too academic;
  the need for adequate modalities of effective collaboration between RTD research institutes and the private sector in ACP countries;
- the weak impact of North-South research cooperation on development due to (i) the frequent asymmetry in these partnerships, which operate to the detriment of the partners in ACP countries; and (ii) the exclusive focus (frequently at the behest of European donors) on three areas (sustainable management of natural resources, agriculture and health), thus effectively excluding new technologies (educational technology, biotechnology, biomedical technology, energy technology, and ICTs in particular); and
- the absence of a shared vision among European donors and developing country governments about the crucial role of RTD in the development process.

The '*National RTD Policy Dialogue*' as a mechanism for formulating a widely supported RTD policy agenda is a critical cornerstone of any replicable framework for ACP-EU policy dialogue on RTD. For, only with their own RTD policy plans and agendas could ACP countries engage themselves in constructive bilateral and multilateral consultations. Therefore, in order to learn from past experiences, it was decided to carry out assessments of the national RTD policy dialogues conducted in Dominican Republic, Ghana, Senegal, Uganda and Vietnam.[13]

In January 2001, 40 researchers, policy makers and representatives of civil society and private enterprises from ACP countries attended an ACP Policy Workshop on RTD in Legon, Ghana. The aims of this workshop were:

- to discuss the findings of the assessments of past and ongoing national RTD policy dialogues in Ghana, Senegal, Uganda, Vietnam and the Dominican Republic; and

- to set the stage for bilateral and multilateral ACP-EU policy dialogues on RTD between ACP countries, the Commission and EU Member States.

The workshop made a strong case for linking RTD and general development policies. This approach was considered particularly relevant given the aim of the Cotonou Agreement (Art. 30D) to make research a cross-cutting concern, to be incorporated into ongoing programmes. Such a 'mainstreamed' role for RTD would permit individual countries to make a case for RTD priorities in their ACP-EU cooperation programmes (National Indicative Plans, NIPs) or regional strategies (Regional Indicative Plans, RIPs). However, the workshop noted that the Commission and regional organizations (such as COMESA and CARICOM) had yet to confirm the importance of national and regional RTD capacities for self-sustained development in ACP countries. Worse still, in the autumn of 2000, the Commission had downgraded the priority of RTD and subsumed it under 'institutional development'.

The workshop therefore called for an all-out effort to lobby appropriate regional organizations such as COMESA and CARICOM to ensure that RTD is included in the RIPs, as well as to ensure that national authorizing officers and EC Delegations in the Dominican Republic, Ghana, Senegal and Uganda push for the inclusion of RTD in their NIPs. References to RTD in these documents would provide the necessary basis for further bilateral and regional ACP-EU policy dialogues on RTD, and for replicating assessment (diagnostic) studies in as many countries as possible. In conclusion, the workshop participants established an informal 'ACP Informal Working Group on RTD' that would function as a 'discussion partner' for an existing EU Informal Expert Group on RTD (in which all EU Member States, plus Norway and Switzerland, are represented) in future multilateral ACP-EU policy dialogue on RTD.

In the first half of 2001, in support of the ACP Informal Working Group, CTA (the Technical Centre for Agricultural and Rural Cooperation) established a website, 'Knowledge for Development', to make available practical information for ACP advocacy work. ECDPM devoted the ninth issue of its web journal 'Capacity.org' to capacity building for policy dialogue on RTD[14] and funded a study to determine the feasibility of establishing an S&T Observatory in East Africa. The members of the ACP Informal Working group themselves succeeded in establishing the formal basis for ACP-EU bilateral policy dialogue by including a reference to the priority to be given to RTD reform in Uganda's NIP and the RIPs of the Southern Africa Region and the Caribbean. They also followed up on a suggestion by the representatives of DG Development that the Commission would be interested in establishing a 'research bridging fund'. They ensured that COMESA and CARICOM wrote to the Commission expressing their interest in such a programme and requesting a study of its feasibility. Thus, the Legon workshop participants undertook what they had promised - to prepare the ground for bilateral and multilateral ACP-EU policy dialogues on RTD in the spring of 2001.

DG Development changed its priorities

The Commission representatives present at the Legon workshop were unable to convey their interest in the initiatives of the ACP Informal Working Group on RTD to their colleagues and Permanent Representatives of Member States in Brussels. DG Development had mainstreamed RTD and was in the process of introducing substantial operational changes in the delivery of its aid. The focus of attention was on the development of new 'toolboxes' of procedures to facilitate these internal changes.

Much more important, however, was the fact that European donor agencies had lost faith in the Commission's commitment to RTD reform in ACP countries. In the late 1990s, they had strongly supported DG Development in developing a new policy for RTD reform in ACP countries. They considered it unacceptable that - only 18 months after its inception - DG Development mainstreamed RTD and buried its brand new policy. Perhaps to demonstrate their feelings about this change of heart, the EU donor agencies declined an invitation to attend a DG Development meeting on RTD reform in ACP countries in mid-June 2001. Instead, they attended a World Bank consultative meeting, organized at very short notice, to introduce and seek support for its new S&T policy.

Following up on the work of the ACP Informal Working Group, ECDPM organized the international policy seminar 'Demanding Innovation' in Maastricht in October 2001.[15] During this seminar, 29 researchers, research policy makers and research users from the South and 28 academics and representatives from donor agencies for the North focused on articulation policies for demand-led research and research capacity building and on identifying clear objectives and specific initiatives from improving the South-North policy dialogue on Science and Technology for Development. They urged the Commission to reconsider recent decisions with respect to the organization and funding of development research and to meet with relevant groups to discuss the implications of the proposed changes in the Commission's system of research funding.

The Commission understands the urgent need for developing research capacity

Judging from its recent action plan, *Science and Society: Towards a New Partnership*,[16] the Commission understands very well the urgent need for increased government support for developing institutional research capacity and technological innovation systems. This policy plan presents a challenging strategy to enhance institutional research

capacities and technological innovation systems by strengthening the relationship between science, technology and innovation on the one hand, and society on the other, by increasingly focusing scientific activities to meet the needs of research end-users. Within the framework of this action plan, the Commission intends to implement a wide range of programmes:

- to raise public awareness regarding the importance of science and technology in economic progress and sustainable development;
- to institute an ongoing policy dialogue on S&T involving stakeholders from research organizations, public authorities, the media, civil society, and private enterprises;
  to increase the number of people who choose a career in science;
- to foster gender equality in science; and
  to include an enhanced ethical dimension in policy making for S&T.

This high-profile initiative 'to pool efforts at the European level to develop stronger and more harmonious relations between science and society' would seem to be a strong, imaginative response to the earlier criticism of its handling of RTD policy for international cooperation. However, nothing could be farther from the truth. The Commission has not formulated its new 'Science and Society' action plan to bridge the technology divide between EU Member States and ACP countries. Rather, it spells out what the Commission intends to undertake in support of the strategic goal for the *European Union* to become the world's most competitive and dynamic knowledge-based economy by 2010. If the plan actually achieves its objectives, it may well serve to widen further the technology divide between EU Member States and ACP countries.

Increased interest in S&T among ACP governments

The Commission's neglect of S&T as an essential ingredient in the economic prosperity of ACP countries is in sharp contrast with the increased interest of ACP governments in the key role that S&T could play in the realisation of their development plans. The conclusions of an ACP Ministerial Forum on Research for Sustainable Development, in Cape Town, South Africa, in July 2002, is instructive in this regard. The meeting was convened by the ACP Secretariat and the Commission, and hosted by the government of South Africa.[17]The participants generated the 'Cape Town Declaration on Research for Sustainable Development'. This declaration articulates a strategic RTD policy, in which the ACP Group of States recognizes the urgent need for national and regional S&T policies formulated through effective policy dialogue; undertakes to pursue all necessary measures to ensure the resources required to promote research, technology diffusion and innovation for sustainable development and poverty reduction; and pledges to review current budget allocations for research and development, and to seek to achieve a minimum investment of 1% of GDP within a period of 10 years.

Interestingly, the declaration also contains several elements that feature prominently in the Commission's 'Science and Society' action plan for the European Union, such as bolstering sustainable development processes with the results of demand-led S&T policies; strengthening national research capacity by encouraging and facilitating careers in science; and promoting regional integration of S&T policies, to foster centres of excellence, and to enhance cross-border sharing of research capacity and expertise.

A Commission that speaks with many voices

The Commission's propensity to send conflicting signals to its collaborators has not helped what may be common goals. DG Development has 'mainstreamed' its RTD policies, and in the process has seemingly lost all interest in supporting the development of RTD capacities and technological innovation systems in ACP countries. In August 2001, however, Mr Philippe Busquin, Commissioner for Research, proposed to the ACP Group of States the formation of a dedicated *ACP-EU partnership in S&T*. Thus in Cape Town in July 2002, 18 months after DG Development had buried RTD as a priority in its development cooperation policies, another branch of the Commission - DG Research - initiated a policy dialogue with the ACP countries to explore the contours of a dedicated partnership.

For ACP countries, the fact that the ACP-EU Technical Forum on Research for Sustainable Development in Cape Town took place may be regarded as a welcome breakthrough. So may the plan to launch an 'ACP-EU Partnership in S&T'. One can only hope that the proposed ACP-EU Ministerial meeting will provide the right platform to start an open, continuing policy dialogue between the parties to work out the priorities and operational details of this new dedicated partnership.

Development economists such as Jeffrey Sachs continue to hammer their drums and argue that modern economic growth is dependent on science-based technologies[18]. They demonstrate that the failure to invest in institutional research capacities and technological innovation systems in developing countries is in fact undermining their efforts to fight poverty, disease and environmental degradation. The ACP Ministerial Forum on Research for Sustainable Development in Cape Town demonstrated an important commitment to the change in approach to formulating RTD policies. Therefore, the Commission's proposal to establish and support a dedicated ACP-EU partnership in S&T is welcome development. One can only hope that the creation of this partnership is not just another 'first step' in a process that is already characterized by many false steps and wasted efforts.

Notes

1 UNDP (2001) *Human Development Report 2001,* Oxford University Press, New York.

2 Pardey, P.G. and N.M. Beintema (2001) *Slow Magic: Agricultural R&D a Century after Mendel* (www.ifpri.org/checknames.cfm/fpr31.pdf?name=fpr31.pdf&direc=d:/webs/ifpri/pubs/fpr) IFPRI, Washington, DC; CGIAR (2001) *CGIAR Annual Report 2000: The Challenge of Climate Change: Poor Farmers at Risk*, Consultative Group for International Agricultural Research, Washington, DC.

3 *The Economist* (2001) 'Aids vaccines on trial', 3 February 2001; WHO (1996) T*he Malaria Control Programme*, World Health Organization, Geneva.

4 Bell, R.M. and Pavitt, K. (1993) 'Technological accumulation and industrial growth: Contrasts between developed and developing countries', in *Industrial and Corporate Change*, vol.2 (2).

5 Government of South Africa (1996) *White Paper on Science and Technology: Preparing for the 21st century*, Department of Arts, Culture, Science and Technology, Pretoria. www.dacst.gov.za/science_technology/

6 Besanzon, K. et al (1999) *Viet Nam at Cross Roads: the Role of Science and Technology*, IDRC, Ottawa.

7 Bortei-Doku Aryeetey, E. et al. (2002), *National Human Development Report 2000: Science, Technology and Human Development*, Government of Ghana/UNDP. http://hdr.undp.org/reports/ detail_reports.cfm?view=502

8 In the following, the terms S&T and RTD (research and technology for development) are used interchangeably.

9 European Commission, Communication to the European Council and Parliament, S*cientific and Technological Research: A Strategic Part of the European Union's Development Cooperation with Developing Countries*, COM (97) 174, final, 25 April 1997.

10 Parliament of the European Union, Resolution A4-0089/99 on RTD in *Development Policy*, dated 9 March 1999.

11 ACP-EU Assembly, 28th Session, Resolution ACP/EU 2749/99/fin on *The Contribution of Research and Science - including ICTs - to Sustainable Development*, 1 April 1999.

12 ACP-EU Policy Dialogue on RTD, was implemented by ECDPM with the assistance of the University of Maastricht, in 2000-2001. For a description of the set up of this project see: Engelhard, R.J. (1999) *Research and Technology for Development (RTD): support to the ACP-EU policy dialogue, a funding proposal version 3.1* for the European Commission's DG Development, the Netherlands Ministry of Foreign Affairs (DGIS-DCO/OZ) and ECDPM.

13 The country assessment reports are available on the website www.demanding-innovation.org. The studies were carried out by resident researchers on the basis of a methodology developed by Wiebe Bijker and his team at the University of Maastricht.

14 www.capacity.org/9/content.html

15 The international policy seminar 'Demanding Innovattion: Articulating Policies for Demand-led research and Research Capacity Buidling' in Maastricht, the Netherlands on 10-12 October 2001 was funded by the Directorate-General for Development Cooperation (DGIS) of the Netherlands Ministry of Foreign Affairs and hosted by ECDPM. Visit the website www.demanding-innovations.org for more information, preparatory reports and the proceedings.

16 European Commission (2002) *Science and Society Action Plan*. Luxembourg: Eur. Commission, Office for Official Pub's.

17 The forum was well attended, with delegations from 41 of the 77 ACP countries, 25 of which were represented by the ministers in charge of their country's S&T policies.

18 Sachs, Jeffrey (2002) 'The essential ingredient'. Essay in *New Scientist*, 17 August 2002.

The European Centre for Development Policy Management (ECDPM) is an independent foundation that aims to improve international cooperation between Europe and countries in Africa, the Caribbean, and the Pacific (ACP). It does this through capacity building for policy management, the promotion of policy dialogue between ACP countries and Europe, and through the provision of information and facilities for knowledge exchange.

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