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Developing Countries facing Global Warming: a Post-Kyoto Assessment. Round-table Debate

by

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KEYWORDS. — Global Warming; Developing Countries; GHG Emissions; Common but Differentiated Responsibility; Adaptation; Mitigation.

SUMMARY. — This paper reports the results of a round-table debate organized by the Royal Academy for Overseas Sciences (RAOS) on *Developing Countries facing Global Warming: a Post-Kyoto Assessment* (Brussels, 13 June, 2009) to highlight the view of developing countries on adaptation to and mitigation of climate change. The participants convened to discuss the various aspects of climate change impacts and adaptation in developing countries preceding the Copenhagen Conference (UNFCCC COP 15) in December 2009. Here, we summarize the point of view of the two invited speakers representing developing countries.

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The discussion, chaired by Morgan De Dapper, President of the “Environment and Development” Commission of the Royal Academy for Overseas Sciences, focused on various developing countries considerations regarding the forthcoming climate change negotiations (Copenhagen in 2009, Cancun in 2010, Cape Town in 2011, ...), including their role in reducing greenhouse gas emissions, their weak position in international talks and their difficulties to adapt to forced climate change.

Speakers representing developing countries were Karimou Ambouta (RAOS; Université Abdou Moumouni, Niamey, Niger) for least developed countries, and Rais Akhtar (RAOS; Jawaharlal Nehru University, New Delhi, India) for emerging economies countries. The Vice-Chair of the *Intergovernmental*

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Panel on Climate Change (IPCC), Jean-Pascal van Ypersele (Université catholique de Louvain, Belgium), joined the round table together with Yvan Biot (RAOS; Research and Evidence Division, Department for International Development, London, UK), who also prefaced the debate. Also participated in the debate: Samy Mankoto (RAOS; UNESCO Paris, France), Bernard Mazijn (Universiteit Gent, Belgium), Bart Muys (Katholieke Universiteit Leuven, Belgium), Jean-Jacques Peters (RAOS; river specialist), Eric Tollens (RAOS; Katholieke Universiteit Leuven, Belgium), Philippe Tulkens (European Commission, Brussels, Belgium), and Marc Van Montagu (RAOS; Universiteit Gent, Belgium).

Developing countries are least responsible for causing climate change but are very likely to face disproportionate impacts in terms of natural disasters, agriculture, health effects and food security since already existing stresses on health, well-being, limited financial, institutional and human resources leave the poor most vulnerable and least able to adapt to the impacts of negative rapid changes, including climate change. Consequently, climate change may undermine the ability of developing countries, particularly least developed countries in Africa, to meet some targets of the Millennium Development Goals (MDGs), thereby slowing progress towards sustainable development. Yet, climate change poses a particular threat to those marginalized from development and global adaptation cost estimates are extremely important as shown in table 1.

Table 1

Estimates of adaptation costs in developing countries, for 2010-2015 (after PARRY *et al.* 2009)

Source	US\$ billion per year
World Bank (2006)	9-41
Stern (2006)	4-37
Oxfam (2007)	> 50
UNDP (2007)	86-109
UNFCCC (2007)	27-66

CO₂ emissions from the burning of fossil fuels are considered to be the primary cause of global warming. Special attention has been focused on the CO₂ directly emitted by each country. Top ten emitters in 2007 are presented in table 2, with comparison values for 1971 and 1990. It shows that twenty-nine gigatonnes of CO₂ from fuel combustion were globally emitted in 2007. Between 1971 and 2007, global emissions doubled, with industrialized countries dominating historical totals. However, the share of developed

countries progressively shrank as developing countries, led by emerging economies such as China and India (with respectively + 650 % and + 565 %), increased at a much faster rate (+ 243 % for non-OECD (Organization for Economic Co-operation and Development) countries). Yet, OECD countries show a 41 % increase during the 1971-2007 period, while representing 69 % of global CO₂ emissions in 1971, 54 % in 1990, and 'only' 47 % in 2007.

Table 2

Estimation of CO₂ emissions from fuel combustion (in 10⁶ tons) and their evolution at the global and regional levels, and top 10 emitting countries in 2007 (accounting for 65 % of the world CO₂ emissions) (adapted from IEA 2009)

Region/Country	CO ₂ emissions (1971)	CO ₂ emissions (1990)	CO ₂ emissions (2007)	Evolution (1971-1990)	Evolution (1990-2007)	Evolution (1971-2007)
World	14,095	20,981	28,962	+ 49 %	+ 38 %	+ 106 %
OECD	9,604	11,440	13,565	+ 19 %	+ 19 %	+ 41 %
Non-OECD	4,491	9,541	15,397	+ 112 %	+ 61 %	+ 243 %
1. China	810	2,244	6,071	+ 177 %	+ 171 %	+ 650 %
2. USA	4,291	4,863	5,769	+ 13 %	+ 19 %	+ 34 %
3. Russian Fed.	1,191	2,180	1,587	+ 83 %	- 27 %	+ 33 %
4. India	199	589	1,324	+ 196 %	+ 125 %	+ 565 %
5. Japan	759	1,065	1,236	+ 40 %	+ 16 %	+ 63 %
6. Germany	979	950	798	- 3 %	- 16 %	- 19 %
7. Canada	339	432	573	+ 27 %	+ 33 %	+ 69 %
8. United Kingdom	624	553	523	- 11 %	- 5 %	- 16 %
9. Korea	52	229	489	+ 340 %	+ 114 %	+ 840 %
10. Iran	41	175	466	+ 327 %	+ 166 %	+ 1,037 %

These recent trends make Rais Akhtar uncomfortable since many observers commented that China overtook the United States in 2007 to become the world's largest emitter of CO₂ emissions from fuel combustion, and that India is about to take the third ranking position. He deplores that most messages stop there without detailing the existing gap between per capita CO₂ emissions (tab. 3). It would then clearly appear that per capita CO₂ emissions are four times higher in developed countries (11 tons per year) than in developing countries (2.7 tons), with an average of 4.4 tons in 2007. The United States alone generate 20 % of the global CO₂ emissions, despite a population of less than 5 % of the world total. In the mean time, China, contributing to a comparable share of global emissions (21 %), accounts

for 20 % of the world population. India, with 17 % of the world population, contributes less than 5 % of the CO₂ emissions. Therefore, the levels of per capita CO₂ emissions are very diverse. Yet, one American citizen is annually responsible of 19.1 tons of CO₂ emissions, that is the equivalent of four Chinese, sixteen Indians, or 80 sub-Saharan Africans issued from least developed countries.

Table 3
 OECD and non-OECD populations (millions);
 part of the world CO₂ emissions from fuel combustion (%);
 CO₂ emissions per capita (tons) in 1990 and 2007 and recent trends (%)
 (adapted from IEA 2009)

Region	Population 2007	% world population (2007)	% world CO ₂ emissions (2007)	CO ₂ emissions per capita (1990)	CO ₂ emissions per capita (2007)	CO ₂ emissions per capita Evolution 1990-2007
World	6,609	100	100	4	4.4	+ 10 %
OECD	1,185	17.9	46.8	10.6	11.0	+ 3 %
North America	441	6.7	24.0	15.6	15.4	- 1 %
Pacific	201	3.0	7.8	8.4	10.7	+ 27 %
Europe	543	8.2	15.1	7.9	7.5	- 5 %
Non-OECD	5,424	82.1	53.2	2.2	2.7	+ 25 %
Europe	53	0.8	1.0	6.5	5.1	- 21 %
North Africa	157	2.4	1.3	1.6	2.3	+ 41 %
Sub-Saharan Africa	802	12.1	1.9	0.7	0.6	- 6 %
Middle East	193	2.9	5.1	4.5	7.2	+ 61 %
Ex-USSR	284	4.3	8.4	12.6	8.5	- 33 %
Latin America	461	7.0	3.7	1.7	2.2	+ 30 %
Asia - China	2,148	32.5	10.6	0.8	1.4	+ 70 %
China	1,327	20.1	21.2	2.0	4.6	+ 133 %

In addition, such data sets on the carbon footprint of nations (tabs. 2, 3) only take into account production-based inventories. Very few studies include the emissions associated with consumption of goods and services in each country. Consumption-based accounting of CO₂ emissions differ from traditional

estimates. GUAN *et al.* (2009) showed that half of the CO₂ emissions increase recorded in China during the early 2000's was due to production of goods for exportation. In 2004, 23 % of global CO₂ emissions were traded internationally, primarily as exports from China and other emerging markets to consumers in developed countries. These studies generally find that rich countries have a larger carbon footprint than their territorial emissions, while the opposite holds for poor countries. In some wealthy countries, including Belgium, Switzerland, Sweden, Austria, the United Kingdom, and France, > 30 % of consumption-based emissions were imported, with net imports to many Europeans of > 4 tons CO₂ per capita in 2004. Net import of emissions to the United States in the same year was somewhat less: 10.8 % of total consumption-based emissions and 2.4 tons CO₂ per person. In contrast, 22.5 % of the emissions produced in China in 2004 were exported to consumers elsewhere (DAVIS & CALDEIRA 2010).

Thus, if Rais Akhtar clearly claims that CO₂ emissions per capita are far from being equivalent, especially for what regards India when compared to any OECD country, Karimou Ambouta adds that Sub-Saharan Africa CO₂ emissions per capita have decreased by 6 % in recent years (1990-2007), while such data have increased by 10 % at the global level (tab. 3), which proves that the development of the poorest populations is still insufficient and scaring.

Both Rais Akhtar and Karimou Ambouta believe that the “common but differentiated responsibility”, one of the key principles in the United Nations Framework Convention on Climate Change (UNFCCC) [1]*, is not respected. Since it is recognized that developed countries are principally responsible for the current high levels of greenhouse gases (GHG) emissions in the atmosphere as a result of more than 150 years of industrial activity, these industrialized developed countries have to take the lead in addressing the climate problem by drastically reducing GHG emissions while excluding developing countries from binding GHG emissions reductions (BROECKER 2007). As it is presented in table 4, this is not the case.

Except for Europe (probably), none of the developed countries will respect their Kyoto Protocol's commitments. As an example, with a GHG emissions increase of 33 % between 1990 and 2006, New Zealand will not respect its obligation under the Kyoto Protocol to reduce its emissions to 1990 levels on average over the 2008-2012 commitment period. In addition to that, the country proposed a GHG reduction objective of – 20 % by 2020 before the

* Numbers in brackets [] refer to the notes, p. 333.

Table 4

Official GHG emissions [2] evolution from 1990 to 2006 in some selected developed countries, their GHG emissions reduction commitment within the Kyoto Protocol and their quantified emission limitation and reduction objectives (QELROs) before the Copenhagen Conference

Countries	GHG evolution (1990-2006)	Kyoto Protocol's commitment (by 2008-2012)	Proposed QELROs for 2020 before Copenhagen Conference
Europe*	-2,7%	- 8,0 %	- 20 % to - 30 % compared to 1990 levels
USA	+ 14,0 %	None	- 15 % compared to 2005, that is - 3 % compared to 1990
Japan	+ 5,8 %	- 6,0 %	- 15 % compared to 2005, that is - 25 % compared to 1990
Canada	+ 54,8 %	- 6,0 %	- 20 % compared to 2006, that is + 24 % compared to 1990
Australia*	+ 6,6 %	+ 8,0 %	- 5 % to - 25 % compared to 2000, that is - 3 % to - 24 % compared to 1990
New Zealand*	+ 33,0 %	0 %	- 10 % to - 20 % compared to 1990

* For Europe, Australia and New Zealand, the lowest QELRO is unconditional while the highest one corresponds to a special objective in the case of a global agreement (OZER 2009a, UNFCCC 2009).

Copenhagen Conference, cutting by half its emissions in fourteen years: an impossible target when considering previous and future energy scenarios, even without including consumption-based emissions. The position of Canada is even worse. While its obligation under the Kyoto Protocol is to cut its GHG emissions by 6 % to 1990 levels on average over the 2008-2012 commitment period, these have increased by over 50 %. Their proposed reduction objective is - 20 % compared to ... 2006, that is allowing a 24 % increase between 1990 and 2020: a very unpleasant objective for an industrialized developed country with respect to developing countries expectancies!

In addition to that, Karimou Ambouta stressed that his country, Niger, lost over one third of its forest cover between 1990 and 2005, mainly because of fuel wood consumption (FAO 2006). Although forest clearing has an impact on GHG emissions through LULUCF, he asked what the responsibility of the Nigeriens in the climate change context is since less than 10 % of the population has access to electricity. According to him, this statement demonstrates the lack of development strategies, especially for what regards energy. Yet, CO₂ emissions per capita from fossil fuel combustion in Niger are estimated to be 0.1 ton per year (OZER 2009b), over one hundred times less than OECD average (tab. 3). In the meantime, Niger records losses of biodiversity, suffers

from advancing desertification, and has to deal with recurrent rainfall deficits causing food shortages and starvation.

This last conclusion, which is common to many poor countries, introduced the topic of “climate justice” and adaptation strategies including its cost and feasibility, raising the question of sustainable development in developing countries, especially arid ones.

For those topics, all speakers agreed with these concerns. The important question of “climate justice”, leitmotiv of many NGOs, has been studied elsewhere but is not a top priority of negotiators (*e.g.* BODE 2004, HALME 2007, RAGUENEAU 2009). Costs and feasibility of adaptation strategies have a central place in current post-Kyoto negotiations and are sensible ethical questions (JOHANSEN 2007, ADGER *et al.* 2009, PARRY *et al.* 2009, GLEMAREC 2010). Sustainable development in developing countries is clearly the central cross-Conventions issue with little global answers (MWEBAZA & KOTZE 2009).

Although some viewpoints may differ among scientists, the main conclusion of the round table is that climate negotiations will be very difficult since, at the political level, most of the above discussion is of little interest compared to the socio-economic interests of different nations or group of nations (*e.g.*, rich, emerging and poor economies).

NOTES

- [1] Article 3 of the UNFCCC states: “The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof”.
- [2] Considering all GHG (CO₂, CH₄, NO₂, HFCs, PFCs and SF₆) as well as land use, land-use change and forestry (LULUCF). All data expressed in CO₂ equivalent (CO₂ eq). <http://unfccc.int/>

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