Overseas Development Institute

Climate Change, Agriculture and Aid for Trade

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Climate Change and International Agricultural Trade Rules

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Outline of Presentation

1. Impact of Climate Change on Agricultural Output and Exports
2. What are the Adaptation and Mitigation Options in the agricultural sector?
3. Finance for Mitigation and Adaptation
4. Linking Aid for Trade to Climate Change and Agriculture
5. Policy recommendations

1. Impact of Climate Change on Agriculture

- The only certainties about the impact of climate change on agriculture are increasing uncertainty, variability and frequency and severity of extreme events (storms, hurricanes, droughts, etc.).

- There are opportunities for some countries under all but the most extreme scenarios (e.g. North America, Russia, China), which lead to an expansion of potential agricultural crop land.

- All scenarios show declining yields in Africa in the long run, but the level and rate of this decline differs amongst scenarios.

Source: Ludi et al. (2007)

1a. Impact on Agricultural Production

	Sub-Saharan Africa	Latin America	South Asia	South East Asia
Temperature	Temperatures to increase by 3-7°C by 2080-2099.	Temperatures to increase by 1-7.5°C by 2070-2099.	Temperatures to increase by 2.3-4.5°C by 2070-2099.	Temperatures to increase by 2-3.8 °C by 2070-2099.
Precipitation	Precipitation to decrease by up to 30-40% in most parts of southern Africa, but to increase by 7% in tropical and eastern regions by 2080-2099.	Precipitation to change by up to -40% to +12% by 2080.	Precipitation to increase by 10-17% by 2070-2099.	Precipitation to increase by 3-8% by 2070-2099.
Agriculture	Rain-fed cereal (wheat, maize, rice) production to decrease by 12% (net loss) by 2080, with great regional variations.	Overall grain yields to change by between -30% to +5% by 2080 e.g. rain-fed wheat production is to decrease by 12-27% by 2080.	Net cereal production to decrease by at least 4-10% e.g. rain-fed wheat production is to decrease by 20-75% by 2080.	Overall cereal production to increase by up to 30%, but rain-fed wheat production is to decrease by 10-95% by 2080.

Note: The wide range of temperature and precipitation reflect the scenarios on which the estimates are based across regions.
Sources: Christensen et al. (2007); IPCC (2007); Ruosteenoja et al. (2003).

1b. Impact on Agricultural Production

Country	Dependence on Agricultural Sector		Vulnerability to Climate Change			
	Agriculture, value added (% of GDP) for nearest year	Employment in agriculture (% of total employment for nearest year)	Agricultural output for 2003		Estimates by the 2080's in % of agricultural output	
			per ha in 2003 USD	Millions of 2003 USD	Without carbon fertilization	With carbon fertilization
Liberia	66	-	419 (c)	1833 (c)	–32.7 (c)	–22.6 (c)
Somalia	66	-	-	-	– 16.6 (b)	– 4.1 (b)
Guinea-Bissau	62	-	419 (c)	1833 (c)	–32.7 (c)	–22.6 (c)
Central African Rep.	56	-	478 (a)	1429 (a)	–60.1 (a)	–54.1 (a)
Ethiopia	47	44.1	253	2,794	–31.3	–20.9
Congo, Dem. Rep.	46	-	422	3,289	–14.7	–1.9
Sierra Leone	46	-	419 (c)	1833 (c)	–32.7 (c)	–22.6 (c)
Tanzania	45	82.1	430	4,634	–24.2	–12.8
Niger	40	-	243	1,092	–34.1	–24.2
Mali	37	41.5	350	1,644	–35.6	–25.9

Notes:(a) Values refer to Other Equatorial Africa (group of following countries: Republic of the , , ,);
(b) Values refer to Other Horn of Africa (group of following countries: ,); (c) Values refer to Other Equatorial Africa (group of following countries: , Guinea Bissau, Liberia,).
Sources: Cline (2007); World Development Indicators for nearest year.

1c. Impact on Agricultural Exports

Country	Agricultural output in 2003, US$ million	Agricultural exports in 2003, or nearest year, US$ million	Agricultural exports as a % of total agricultural output (a)	Vulnerability to climate change: Estimates by the 2080's in % of agricultural exports (b)	
				Without carbon fertilization	With carbon fertilization
Malawi	651	439	67.5	-20.9	-14.2
Zimbabwe	3,018	855	28.3	-10.7	-8.1
Senegal	1,104	185	16.8	-8.7	-7.5
Mali	1,644	403	24.5	-8.7	-6.3
Burkina Faso	1,296	286	22.0	-5.4	-5.4
Zambia	997	149	15.0	-5.9	-4.6
Ethiopia	2,794	451	16.1	-5.0	-3.4
Guinea-Bissau	1,833	59	14.0	-4.6	-3.2
Madagascar	1,587	330	20.8	-5.4	-3.1
Niger	1,092	82	7.5	-2.6	-1.8

Note: (a) Calculated based on agricultural output and export values; (b) calculated based on agricultural output and export values as of 2003. Ethiopia excludes Eritrea. Agricultural exports are defined as those included under the WTO Agreement on Agriculture.
Source: Cline (2007); UNComtrade.

2. What are the Adaptation and Mitigation Options

a) ‘climate change proofing’ existing products and methods of production;

b) diversifying into new products and methods of production; and

c) diversifying into new tradable services.

2a) Climate change proofing existing products and methods of production

UNFCCC estimates of global investment costs for adaptation

Sector	Global cost ($bn per annum)	Of which developed countries	Of which developing countries	Residual damage
Agriculture	14	7	7	-
Water	11	2	9	-
Human health	5	0	5	-
Coastal zones	11	7	4	1.5
Infrastructure	8-130	6-88	2-41	-
Total	49-171	22-105	27-66	1.5

Source: UNFCCC (2007a) as presented by Wheeler and Tiffin (2009).

Estimates refer to three distinct cost items:

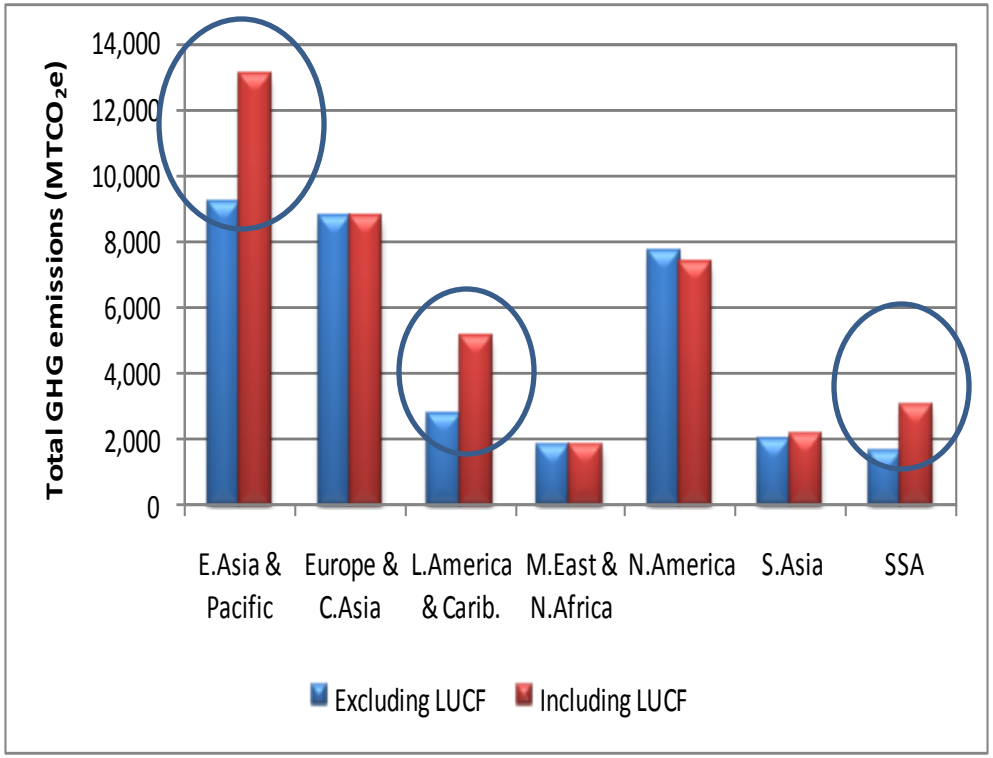
1. better extension services at the farm level;
2. the cost of additional global research (e.g. on new cultivars);
3. and extra capital investment at the farm level (Wheeler and Tiffin, 2009).

They are 'top down' estimates; that is they are based on the increments that should be made to existing expenditure

2b) Diversifying into new products

- **Trade in Carbon:** Around 30% of the total GHG abatement opportunities identified fall within the 'terrestrial carbon' category. Of the total amount of terrestrial carbon abatement opportunities by McKinsey, 90% are located in the developing world.

Sub-categories Identified in Terrestrial Carbon
Crop nutrient management
Rice management
Reduced slash and burn agriculture
Reduced pastureland conversion
Reduced intensive agriculture conversion
Pastureland afforestation
Grassland management
Organic soil restoration



2b) Diversifying into new products cont…

Low Carbon Goods: Brenton et al. (2008) note that the effective inclusion of low income countries in labelling schemes may offer important opportunities for carbon emissions reductions through incentivising increased trade - due to the favourable climatic conditions of developing countries and their use of low energy intensive production techniques.

	Country	
Supply chain section	**Kenya**	**Netherlands**
Production	300	36,900
Packaging	110	160
Transport to airport	18	0
Transport to RDC (air)	5,600	0
Transport to RDC from airport	5.9	50
Total	6,034	37,110

But without a well designed and approved carbon labelling and or 'sustainability' methodology, there is a risk that some low carbon products, including some types of first generation biofuel, are not recognised…

Source: Edwards-Jones at al. (2008)
Note: Emissions are shown as Global Warming Potential (GWP) expressed in kg of CO_2 equivalents using the IPCC (2001) conversion factors. GWP and CO2 emissions from Kenya include the IPCC altitude factor.

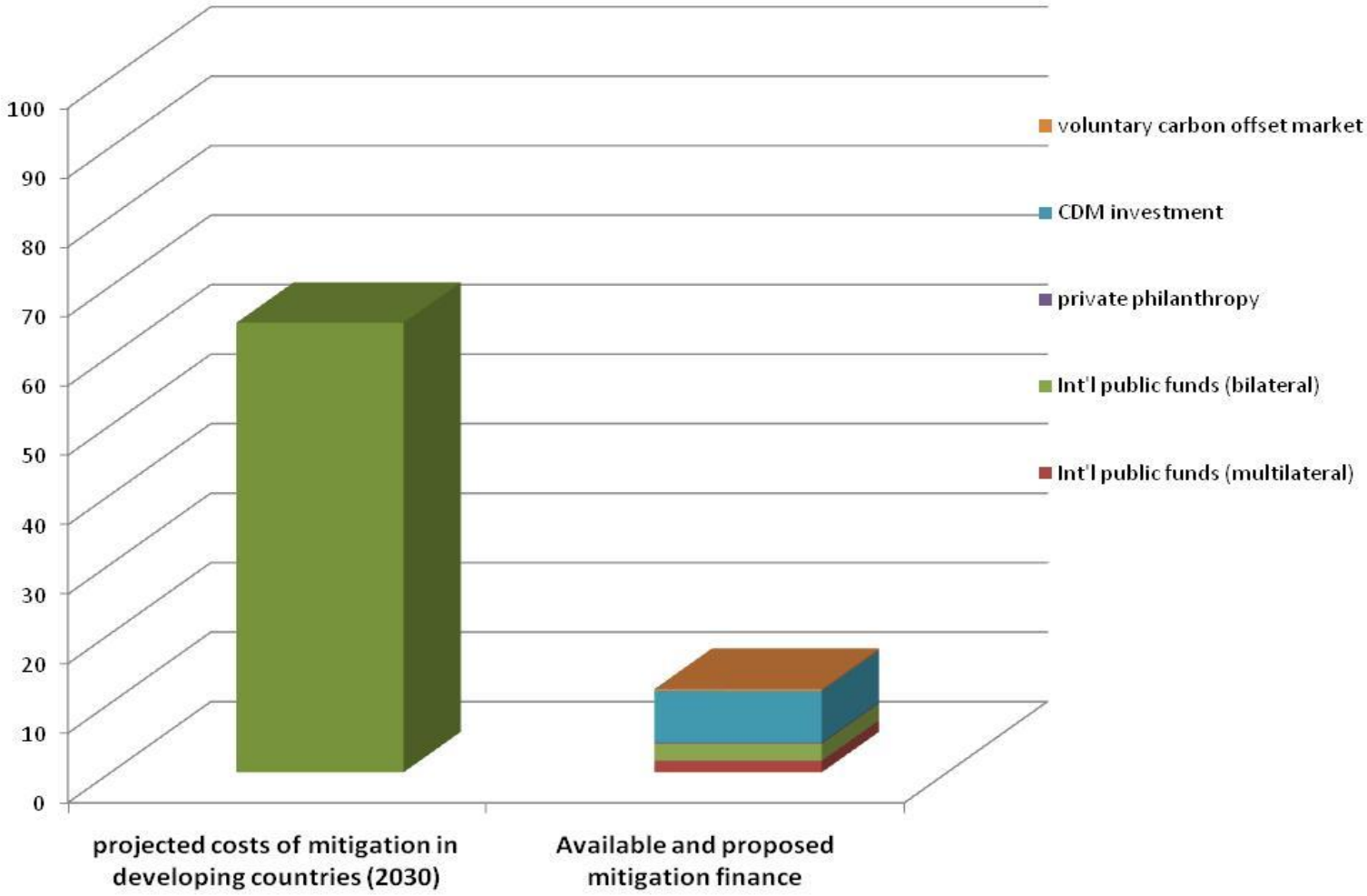
2c) Diversifying into new services

- New tradable services are likely to be needed in the transition towards a low carbon global economy, such as the verification of carbon emissions.
- There is a need for new types of services and institutional infrastructure to support trade in carbon, and/or low carbon products.
- The development of such 'new' services could be developed in parallel with those that already exist such as tourism, air freight and shipping.
- The World Bank (2009) estimates that least developed countries could gain as much as $4-10billion from a levy on international air travel (IATAL) and around $4-15billion from levies on bunker fuels (IMERS).

3a. Finance for Mitigation

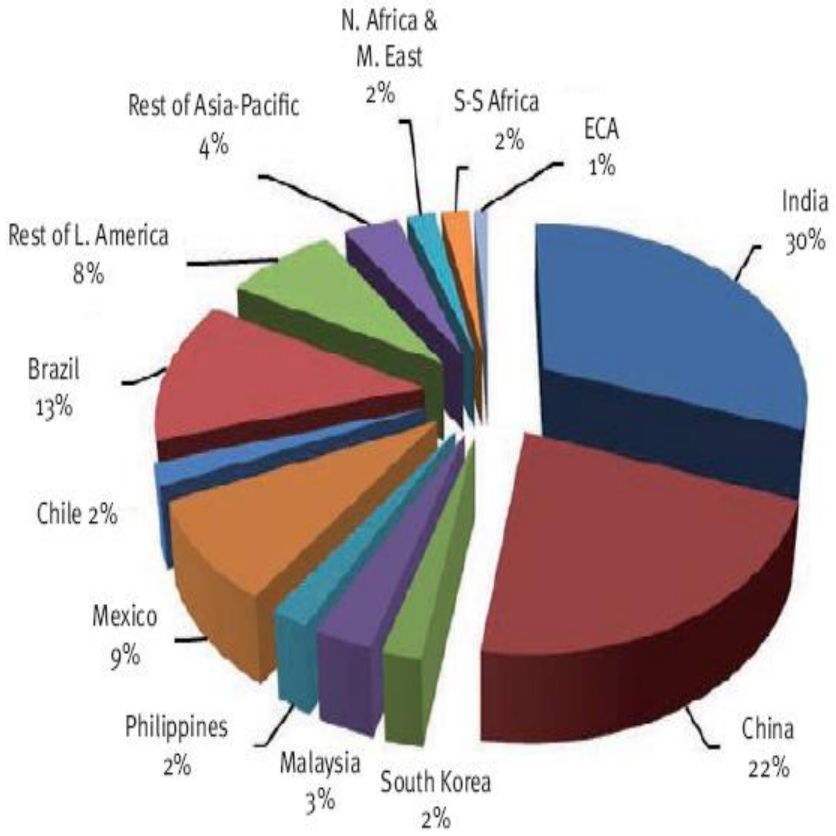
	Amount per annum (US$Bn)	Source
Projected costs of mitigation		
Projected costs of mitigation (between 2010-2020)	71-103	McKinsey (2009)
Pledged mitigation finance (2008-2012)		
International public funds (multilateral)	1.68	www.climatefundsupdate.org
International public funds (bilateral)	2.46	www.climatefundsupdate.org
Private philanthropy	0.2	Design to Win (2007)
CDM investment	7.4	Capoor & Ambrosi (2008)
Voluntary carbon offset market	0.27	Capoor & Ambrosi (2008)
Proposed future mitigation finance (2012 and beyond)		
Proposed innovative financing mechanisms	Ranges up to 201	Brown (2008)
Note: As of March 2009		

3b. Finance for Mitigation



3b cont…The potential for terrestrial carbon trade

Location of registered CDM projects to date (up to August 2008)



Source: adapted from UNEP Risoe (2008)

- The limited participation of sub-Saharan Africa in the first commitment period of the CDM is to some extent to be expected: large developing country emitters, such as China, have benefited the most from the CDM to date because they emit more and therefore have emissions ready to be offset.

- But: "a soil compliance carbon market holds great potential for achieving the necessary balance between intensifying productivity, protecting natural resources, and simultaneously helping rural development in some of the worlds poorest communities" World Bank (2009, Chapter 3:42).

3c) Finance for Adaptation

- **International Institutions:** Currently, there are two dedicated adaptation funds under the UNFCCC, which are managed by the Global Environmental Facility (GEF): The Least Developed Countries Fund (LDCF); and The Special Climate Change Fund (SCCF). The LDCF supports the preparation and implementation of National Adaptation Plans of Action (NAPAs).

- **NAPAs:** Focus on enhancing adaptive capacity to climate variability and provide a process for LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change.

3c) cont…Examples of adaptation in agricultural sector

Country	Adaptation Plan related to Agriculture (a) (b)	Indicative Project Cost in US$ c)	Basis of assumptions	Country-specific source
Bangladesh	Promotion of research on drought, flood and saline tolerant varieties of crops.	5,050,000	A mean annual temperature increase of 2.4°C, a mean annual precipitation increase of 10% and a sea level rise of 88cm, all by 2100.	NAPA Bangladesh, http://unfccc.int/resource/docs/napa/ban01.pdf
	Promoting adaptation to coastal crop agriculture to combat increased salinity.	6,550,000		
	Adaptation in agricultural systems in areas prone to enhanced flash flooding–North East and Central Region.	6,550,000		
		18,150,000 (sum of all NAPA projects: 77,275,000)		
		23% of NAPA allocated to the Agricultural Sector.		
Malawi	Improving community resilience to climate change through the development of sustainable rural livelihoods.	4,500,000	Not specified.	NAPA Malawi http://unfccc.int/resource/docs/napa/mwi01.pdf
	Improving agricultural production under erratic rains and changing climatic conditions.	3,000,000		
		7,500,000 (sum of all NAPA projects: 22,930,000)		
		33% of NAPA allocated to the Agricultural Sector		

4. Linking Aid for Trade to Climate Change and Agriculture

- Technical assistance for trade aims to help developing countries to design and implement trade policy effectively and producers within them to be competitive, given the policies, markets, products, and conditions which face them, now and in the future.

- While good technical support programmes should prepare countries to meet any expected as well as the actual trading environment, some changes affecting international trade may be so large or so uncertain that trade assistance must allow for them explicitly.

- Climate change and the conventions in response to this will affect:

  - what is produced,
  - what is traded,
  - trading rules,
  - the standards traded goods must meet,
  - and the regulations which they must follow.

4a) Scope of Aid for Trade

- The Task Force (WTO 2006) defined the scope of Aid for trade as:

- **Trade policy and regulations**, including: training of trade officials, analysis of proposals and positions and their impact, support for national stakeholders to articulate commercial interest and identify trade-offs, and technical support to facilitate implementation of trade agreements inc. rules and standards.

- **Trade development**, including: investment promotion, analysis and institutional support for trade in services, business support services and institutions, public-private sector networking, e-commerce, trade finance, trade promotion, market analysis and development.

- **Trade-related infrastructure**, including: Physical infrastructure and building productive capacity.
- **Trade-related adjustment**, including: Supporting developing countries to put in place accompanying measures that assist them to benefit from liberalized trade.
- **+ Other trade-related needs.**

4b) Linking AfT to the needs of the agricultural sector, related to CC

- **Trade development:** Some developing countries are likely to need assistance in order to take advantage of the CDM. If carbon labelling becomes more prominent, developing countries should be involved in the standard setting and commensurate support given to national accreditation systems.

- **Trade-related infrastructure:** Many of the types of infrastructure in the plans for the agricultural sector included in NAPAs reviewed could be related to support for trade. These include Guinea, rehabilitating hydro systems, and Senegal, irrigation.

- **Building productive capacity:** Assisting countries first to diversify to reduce vulnerability; second to find new areas of specialisation, meet new regulatory requirements etc. For example adapting crops to salinity and risks of flooding in Bangladesh, building capacity in DRC, improving crop and livestock production in Madagascar, and adapting agricultural production to erratic precipitation in Malawi.

4c) cont… Linking AfT to the needs of the agricultural sector, related to CC

- **Trade-related adjustment:** The potential increase in the size and frequency of climate-related shocks will affect traded products: compensation schemes for shocks to supply or to prices of commodities are among the earliest forms of trade related assistance from the international financial institutions. They could cover climate related shocks.

- **Other trade-related needs:** The WTO Task Force (2006) did not want to exclude any measures which a country could show were intended to improve its trade. This category can therefore be used for any trade-related climate projects that do not fall under one of the designated categories.

5. How could and should CC finance and AfT work together?

- As both **trade and climate change related programmes** are, in part, for international objectives and for the benefit of countries other than the direct recipients of assistance, they **should not be considered quantitatively part of official development assistance.**

- That targeted assistance should be additional to normal ODA **does not mean that it should be separate from it at the level of programmes or projects.**

- There will be temptations for those concerned with any special need, including trade and climate change, to try to divert funds from those for general development or from those for potentially related needs. **Any new purpose for Aid for Trade would require additional funding to avoid diversion from existing needs**.

5a)…How could and should CC finance and AfT work together?

- **There is clearly much scope:** many of the donors that have provided mitigation and adaptation finance are also involved in trade-related assistance.

- However, given that there are **not yet checks to ensure compatibility** suggests that coordination between institutions and programs needs to be improved; which may, at the same time serve to reduce potential conflicts between competing demands (and agendas).

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5c) Summary messages

- The agricultural sector is highly distorted globally - the increased stress to the system brought about by climate change makes reform in global agricultural policies even more important.

- International policies to support a more efficient use of, and trade in, low-carbon products and services (of which some examples have been given) is vital.

- Policies in low-income countries can also support a more market based approach to a lower carbon environment. For example, the careful design of levies on bunker fuels could enable a significant increase in domestic tax revenues which will help mitigate necessary domestic adjustment.

- The Aid for Trade initiative was (is) in large part about delivery of a global public good. In the current environment of donor resource constraint the need to establish standalone financing mechanisms becomes arguably even more important, given the need to act now to mitigate dangerous climate change.

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Thanks and comments welcome:

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