

trade hot topics

Intellectual Property Rights and the Transfer of Environmentally Sound Technologies

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Background

The impact of climate change has emerged as a major threat to development and poverty reduction efforts in many developing economies, including least developed countries (LDCs) and small vulnerable economies (SVEs). The global effort to address climate change will inevitably require changes in production systems particularly in those countries that heavily rely on sectors such as agriculture, fisheries, forestry, and tourism. The consequences of climate change will be particularly significant for LDCs and SVEs, partly due to the relatively high cost of mitigation and adaptation measures as compared to their gross domestic product (GDP). In some African nations, for example, the cost of adapting to observed and projected climate change effects is estimated at as much as 10 per cent of national incomes, while in some SVEs the comparable estimates exceed the national GDP.¹

Clearly, addressing the costs of devising and implementing necessary policy measures to address climate change is a considerable challenge for LDCs and SVEs. These countries have a very low capacity to independently mitigate and adapt to the negative effects of climate change, both within sectors and across individual countries or regions. Concerted efforts will be required to reduce their vulnerability

and increase their resilience to the risks of climate change. Further, credible and efficient solutions are needed to address the interrelated issues of mitigation, adaptation, competitiveness and long-term development goals that coalesce at the intersection of global trade and environmental protection policies.

Technology transfer is widely seen as an integral part of sustainable development planning, particularly in the case of access to environmentally sound technologies (ESTs). New technologies are necessary to effectuate national goals regarding stabilisation and reduction of atmospheric greenhouse gases (GHGs) and to enhance the capacity of poor countries to respond to shifts in resource endowments that are expected to accompany climate change. Technology transfer has been a notable element in several multilateral environmental agreements, including the Convention on Biological Diversity (CBD) and the Multilateral Fund of the Montreal Protocol, and it is now an indisputably essential feature of a forthcoming final version of the United Nations Framework Convention on Climate Change (UNFCCC). However, there remains high uncertainty

¹ See OECD (2008), *Economic Aspects of Adaptation to Climate Change: Costs, Benefits, and Policy Instruments*; Stern, N (2007), *The Economics of Climate Change: The Stern Review*, Cambridge University Press; UNDP (2007/08), *Human Development Report*.

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Table 1: Some effects of climate change on developing economies

Vulnerable Sectors	Observed and Projected Climate Change Risks
Agriculture and Fisheries	Increased food insecurity due to loss of arable and grazing lands caused by erosion, inundation, salinisation, desertification and decline in freshwater supply
	Increased unpredictability of growing seasons and uncertainty in crop planning
	Decreased yields and revenues from rain-fed crops
	Further depletion of fish stocks and increased risks to aquaculture industry due to increased water temperatures, rising sea level and higher frequency and intensity of tropical cyclones
Water Resources	Increased water stress due to rising temperatures and shifting precipitation patterns
	Reduction in water quality due to floods, droughts and coastal inundation
	Increased frequency and severity of flooding caused by melting glaciers, followed by decrease in river flows
Public Health	Alteration in the prevalence, transmission patterns and toxicity of diseases, including malaria, dengue fever, meningitis, cholera, etc.
	Increased heat stress and increased risks to life caused by extreme weather events
Coastal Zones	Increased threat of inundation in low-lying coastal areas due to rise in sea level, erosion and extreme events
	Increased threats to habitability of some countries, particularly Small Island Developing Countries (SIDs)
	Decreased availability and quality of drinking water in coastal communities
	Increased pressure on inland communities due to inward migration of coastal populations
Tourism	Decreased revenues from tourism due to rising sea level, beach erosion, degradation of terrestrial/marine ecosystems and increased frequency and intensity of extreme weather events

Source: Tomas Felcman, as compiled from various reports by WTO-UNEP and UNFCCC.

regarding the best modalities by which to address the challenges of climate change and technology transfer to low income countries.

This issue of Commonwealth Trade Hot Topics discusses various aspects of the international regulation of Intellectual Property Rights (IPRs) that can strengthen prospects for the transfer of climate-related technologies to developing countries, particularly small states and LDCs. It articulates existing measures that could enable these countries to meaningfully benefit from current flexibilities regarding access to technology, while also informing the ongoing policy debate by highlighting development-focused options with respect to the relationship between IPRs, technology transfer and climate change.

IPRs and ESTs in climate change mitigation and adaptation

Technology transfer is a core component of a viable climate change treaty and one of the four pillars identified in the Bali Action Plan. Within the context of technology transfer for mitigation and adaptation, certain questions have pertinent bearing on the economic growth prospects of developing economies, LDCs, and in particular SVEs, and on the capacity of these countries to adjust their productive processes to use land resources more efficiently, to develop and adopt new energy sources, and to accommodate social disruptions in areas such as health, labour and infrastructure that are associated with climate change. Effective, long-term climate-

related adjustments in key sectors such as agriculture, fisheries and tourism require sustainable access to mitigating and adaptive technologies (Table 2). Long-term development gains are heavily dependent on the acquisition and absorption of new technical knowledge and the ability to transform that knowledge in ways that are relevant to domestic priorities and consistent with the relevant social and institutional context. In this context, appropriately designed IPRs can play a vital role in encouraging private investments in innovation, promoting access to new knowledge-intensive goods and encouraging downstream innovation.

Mapping ESTs on to the international system for IPR protection reveals the complex and indispensable relationship between the subject matter of IPRs and access by poor and vulnerable countries to technologies. As a preliminary matter, it should be noted that while most technologies are subject to protection under existing categories of IPRs, this does not preclude the use of various other mechanisms – such as technological protection measures (TPMs) or contracts – to further insulate valuable technical knowledge from the flexibilities associated with the IPRs system. Thus, the question of access to ESTs should be considered in the broad context of innovation policy and how legal mechanisms can be adjusted to facilitate greater innovation and dissemination of new technologies in a manner consistent with the public policy goals of the IPR system.

Table 2: Adaptation measures and ESTs

Vulnerable Sectors	Reactive Measures	Proactive Measures	Examples of Relevant ESTs
Agriculture and Fisheries	<ul style="list-style-type: none"> • Construction of new irrigation infrastructure • Improved soil fertility maintenance and erosion control • Introduction of new crops and different cultivars • Restoration of peaty soils and degraded lands 	<ul style="list-style-type: none"> • Diversification of crops • Development of drought/salt/pest resistant crops • Introduction of early warning systems (e.g. floods/droughts) • Outreach programmes on soil/water conservation and management 	<ul style="list-style-type: none"> • Drought/salt/pest resistant seeds • Seedling transplantation • Weather forecasting technologies, including software • Irrigation systems • Improved cultivation techniques • Instructional materials
Water Resources	<ul style="list-style-type: none"> • Improved management of existing water supply systems • Protection of water catchment areas and groundwater resources • Ground/rainwater harvesting and desalination 	<ul style="list-style-type: none"> • Construction of water recycling facilities • Reform of water pricing and irrigation policies • Introduction of drought monitoring systems 	<ul style="list-style-type: none"> • Water purification and recycling technologies • Soil sensors • Drills, pumps and other water harvesting technologies • Distillation technologies
Public Health	<ul style="list-style-type: none"> • Health system reform • Improved availability of essential medicines in rural areas • Improved sanitary conditions • Elimination of extreme poverty • Improved nutrition • Improved housing conditions 	<ul style="list-style-type: none"> • Preventive vaccination • Development of disease/vector monitoring systems • Educational and outreach programmes • Improved maternal and fetal care • Development of epidemics management systems 	<ul style="list-style-type: none"> • Drugs, vaccines and medical equipment • Sanitation technologies • Disease/vector monitoring technologies • Zoning schemes for dense urban areas • Educational materials on health, nutrition and prevalent diseases
Coastal Zones	<ul style="list-style-type: none"> • Development of inundation and beach erosion prevention systems • Introduction of early warning systems • Reinforcement of vital infrastructure 	<ul style="list-style-type: none"> • Development of integrated disaster management systems • Improved zoning in coastal areas • Awareness campaigns on public safety and disaster management 	<ul style="list-style-type: none"> • Weather forecasting technologies • Inundation prevention technologies (e.g. levies, pumps, etc.) • Design plans for flood-resistant housing
Tourism	<ul style="list-style-type: none"> • Improved beach maintenance • Protection and conservation of biodiversity • Improved building construction in coastal areas 	<ul style="list-style-type: none"> • Economic diversification • Development of disaster prevention and management strategies • Improved marketing strategies 	<ul style="list-style-type: none"> • Beach maintenance machinery • Sea walls • Biodiversity monitoring technologies • Sanitation technologies

Source: Tomas Felcman, as compiled from various reports by WTO-UNEP and UNFCCC.

The role played by IPR regimes in the process of North–South technology transfer continues to be a highly controversial topic in various national and international forums. On the one hand, strong IPR protection arguably creates economic incentives for technological innovation and encourages international technology transfer by facilitating foreign direct investment (FDI), technology licensing and trade in IP-sensitive goods and services. On the other hand, IPRs, particularly the patent regime, can impede access to useful knowledge goods and present a barrier for downstream innovation and adaptation of technologies for local use. This is of particular concern as regards agricultural technologies where patent claims tend to be broad, implying that the patent owner will have strong market power vis-à-vis local competitors with respect to the covered innovation. What is clear, however, is that IPRs do fundamentally affect North–South technology transfer by creating incentives for economic actors in various phases of technology development, diffusion and implementation. The precise role played by IPRs in environmental technology transfer nonetheless varies from country to country and even from sector to sector. The dissemination of ESTs from developed countries to developing countries and LDCs is a highly complex process affected by numerous social, economic and cultural variables that need to be accounted for and appropriately co-ordinated by policy-makers at all levels. IPRs are but one, albeit important, of these variables.

Policy environment for the transfer of ESTs

The debate over whether IPRs are a barrier to the transfer of ESTs is usually limited to utility patents. While patents are certainly the IPR of choice with respect to many environmental technologies, other forms of IPRs will likely play important roles at different points along the transfer chain – from research and development (R&D), to product design, commercialisation, deployment, use and absorption. Policy-makers must attend to the different types of IPRs and their possible effects on the technology transfer process in deciding which policy options are best suited to induce optimal levels of innovation to address climate change. Alternative models could also spur innovation, particularly with respect to adaptation and improvements necessary to accommodate distinct institutional and cultural conditions in SVEs and LDCs. For example, in the area of public health, which like climate change is also a global public good, alternatives such as a prize system or liability rules for data exclusivity for

drug manufacturers have been seriously considered as part of a collage of policy options to stimulate innovation alongside the traditional IPRs system. In funding access to ESTs for poor countries, it is important to consider when these alternatives may offer stronger opportunities to increase the level of technical knowledge in circulation in global technology markets, and when incentives to innovate under open-access conditions can appropriately encourage public-private partnerships to foster access to ESTs by LDCs and SVEs.

Where the IPR system is concerned, there are sector-specific issues that should be identified in prioritising gains from technology transfer mechanisms. For example, given the critical role of agriculture for the economies of most SVEs and LDCs, these countries must take every advantage of flexibilities within the international IPRs framework, while also exploiting discretionary policy space specifically directed at establishing national protection schemes for plants and plant varieties. Article 27.3(b) of the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) leaves open to member countries under what regime to protect plant varieties – whether through patents or sui generis regimes. Important legislative initiatives in this regard by Brazil, China and India, among others, should serve as examples for LDCs and SVEs. Under recent domestic laws, these countries have designed legal protection for plant varieties that co-ordinate TRIPS obligations with aspects of the CBD, while paying attention to the interests of farming communities, protection for genetic materials and preserving access to seeds and other associated knowledge. In addition to the positive effects such laws are likely to have on enhancing food security, the provisions also reflect a balancing of rights and interests between encouraging innovation, promoting competition and access to preserving genetic resources. These important legislative enactments by leading developing countries should motivate progress in this regard on a South–South basis, including facilitating relevant capacity-building and technical assistance to design and implement similar regimes in LDCs and SVEs.

Technology transfer and the TRIPS Agreement

Despite the fact that the TRIPS Agreement explicitly incorporates technology transfer within its provisions, the Agreement has to date not been successful in stimulating domestic innovation and

leading to a significant increase in the flow of ESTs (or other technologies) from developed to developing economies. The reasons for this extend beyond IPR considerations to the prevailing macroeconomic conditions in these countries. There are also overarching policy reasons why the TRIPS Agreement has produced few tangible results with regard to facilitating access to technology. Unlike TRIPS provisions on the various IPR subjects covered by the Agreement, which contain strong and mandatory standards, the development-related objectives set forth in TRIPS Article 7 are not buttressed by enforceable stipulations that would ensure that these objectives are in fact met. However, the Doha Ministerial Declaration is explicit in its reference to these important objectives, stating in broad terms that the work of the TRIPS Council ‘shall be guided by the objectives and principles set out in Articles 7 and 8 of the TRIPS Agreement and shall take fully into account the development dimension’. This is the strongest formal recognition of the constitutive force of these Articles and progress in this regard may provide some leverage for negotiating the conditions for the transfer of ESTs.

There are three major provisions in TRIPS that affect the conditions for access to ESTs. Under Articles 13 and 30, countries are required to confine any domestically enacted limitations and exceptions (L&Es) to IPRs and assess their legitimacy under the strictures of what is commonly referred to as the ‘three-step-test’. The test has been classically viewed as a limitation on the policy discretion available for countries to modify domestic IPRs legislation, with no normative counterbalances to the exclusive focus on the private interests of rights holders. Recent initiatives suggest, however, that this restrictive approach – recognised by the WTO dispute panels – is neither unavoidable nor desirable as a policy or pro-development matter. Based on these proposals, and within the context of TRIPS implementation, WTO and member countries when applying the test could, inter alia, take into account the interest of third parties, including the public; and give particular weight to uses that are underpinned by fundamental rights and other broader objectives, including scientific progress and cultural or economic development. Access to ESTs, or other policies designed to address climate change that involve technology transfer, could quite easily fall within this more generous interpretive ambit. This approach would also be an opportunity to infuse substantive force into Article 8 of the TRIPS Agreement, which states: ‘Members may, in

formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement’.

Further, Article 31 of the TRIPS Agreement recognises the limits of exclusive reliance on market mechanisms to sufficiently supply technology needs in all circumstances. It acknowledges that countries may provide for unauthorised use of protected technologies, or, compulsory licensing. A remarkable observation regarding Article 31 is that compulsory licensing has been more widely used by the developed countries than by developing countries and LDCs, particularly with respect to government use licences directed at the supply of public goods such as health or education.

It is well known that Article 31 contains burdensome procedural requirements involving transaction costs well beyond the capacities of most developing economies, and certainly all LDCs. One proposal in the context of climate change that has been widely discussed is the possibility of a ‘Declaration on Access to ESTs’ similar to the Doha Declaration on Public Health. The core element of such a Declaration would be to limit the conditions associated with issuing a compulsory licence, particularly the limitation in Article 31(f) confining such licences to the supply of the domestic market in the country authorising the use. A waiver for ESTs similar to that for the public health context could be a useful start. It is important to note, however, that among other complicating factors, the heterogeneity of climate change technologies is likely to make such a mechanism of far less utility in the environmental context. At a minimum, a geographical waiver based on the graveness of environmental deterioration is most appropriate and would be an important safeguard for the legitimate IPR interests of technology owners.

Some species of a general (and temporary) waiver under Article 31 would be particularly important for small markets or economies where reliance on market forces is unlikely to yield new technologies. In such circumstances, a publicly funded research licence, whether designed as a type of compulsory licence, or utilising L&Es to access protected technical data, could be an important policy tool to facilitate technology transfer. Neither the TRIPS Agreement nor other multilateral agreements

prohibit a government from donating the results of publicly financed science or R&D to the public. Given that most climate-related R&D is funded by governments in developed countries, hybrid models of ownership could be explored that combine the interests of those that would commercialise technology with reasonable terms of access by LDCs and SVEs. For example, private firms involved in public-private partnerships may be granted full ownership interests provided that technologies are made available to LDCs and SVEs on favourable terms, with proper adjustments made for enforcing limits on parallel imports or otherwise protecting price-discrimination strategies. Arguably, this is also one way developed countries could fulfil their technology transfer obligations under TRIPS Article 66(2), while also advancing the goals of the UN Framework Convention on Climate Change.

Conclusion

There is no single policy solution to the issue of how best to efficiently and effectively facilitate sustainable access to ESTs by SVEs and LDCs. What is required is a differentiated approach to IPRs and innovation more generally; careful consideration

of the trade-offs involved in technology transfer, including between energy efficiency and economic efficiency; short-term responses to climate change and long-term development progress; and the relative costs of fiscal and environmental policies that subsidise technology transfer rather than exclusive reliance on market mechanisms. In some cases, costly alternative technologies will require targeted subsidies or other fiscal support, such as tax-credits. In others, non-voluntary licences of IPRs may be necessary to address particularly sensitive industries where a relevant technology could have a greater than marginal effect on adaptation or mitigation efforts. A 'one-size-fits-all' regime or response to the crucial need to develop, deploy and absorb ESTs in global markets is wholly inadequate, lacking normative justification and without empirical support that it can be relevant to all economies for all circumstances. Instead, a pro-competitive, pro-development and publicly conscious approach to a governance regime for technology transfer requires flexibility, adaptability and sustainability in the interests of those most threatened by climate change.

International Trade & Regional Co-operation Section at the Commonwealth Secretariat

This Trade Hot Topic is brought out by the International Trade and Regional Co-operation (ITRC) Section of the Economic Affairs Division (EAD) of the Commonwealth Secretariat, which is the main intergovernmental agency of the Commonwealth - an association of 53 independent states, comprising large and small, developed and developing, landlocked and island economies - facilitating consultation and co-operation among member governments and countries in the common interest of their peoples and in the promotion of international consensus-building.

ITRC is entrusted with the responsibilities of undertaking policy-oriented research and analysis on trade and development issues and providing informed inputs into the related discourses involving Commonwealth members. The ITRC approach is to scan the trade and development landscape for areas where orthodox approaches are ineffective or where there are public policy failures or gaps, and to seek heterodox approaches to address those. Its work plan is flexible to enable quick response to emerging issues in the international trading environment that impact particularly on two highly vulnerable Commonwealth constituencies - least developed countries (LDCs) and small states.

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ITRC undertakes activities principally in three broad areas:

- It supports Commonwealth developing members in their negotiation of multilateral and regional trade agreements that promote development-friendly outcomes, notably their economic growth through expanded trade.
- It conducts policy research and consultations that increase understanding of the changing of the international trading environment and of policy options for successful adaptation.
- It contributes to the processes involving the multilateral and bilateral trade regimes that advance the more beneficial participation of Commonwealth developing country members, particularly small states and LDCs.

ITRC Recent Activities

ITRC's most recent activities focus on assisting member states in the WTO Doha Round and the Economic Partnership Agreement (EPA) negotiations involving the African, Caribbean and Pacific countries (ACP) and the European Union (EU), undertaking analytical work on a range of trade policy and development issues, and supporting workshops/dialogues for facilitating consensus-building on issues of Commonwealth members' interest, exchange of ideas, and disseminating results from informed analysis.

Selected Recent Meetings/Workshops supported by ITRC

7-8 July 2009: Conference on Managing Regional Integration in South Asia, held in Dhaka, Bangladesh

24 June 2009: Conference on Political Economy of Competition and Regulation in Developing Countries, held in Jaipur, India

23-24 June 2009: ACP Preparatory Meeting for the WTO Second Global Review of Aid for Trade, held in Geneva, Switzerland

15-17 June 2009: Workshop on Strengthening Skills of Government Officials in Sub-Saharan Africa on Commercial Diplomacy and Trade Policy Issues, held in Nairobi, Kenya

10 June 2009: Prime Ministerial Caribbean Banana Policy Review Meeting, held in Castries, St Lucia

10 June 2009: Discussion meeting on Challenges to Small States in the Multilateral Trading System, organised during the World Trade Week, UK (8-12 July 2009), held in London, UK

9-10 June 2009: Commonwealth Investment Experts' Meeting, held in London, UK

18 May 2009: Seminar on Preference Erosion: How Much and What To Do About It?, held in London, UK

22-23 May 2009: Workshop on Trade Policy and Trade Agreements for the Members of the Parliament of Bangladesh, held in Dhaka, Bangladesh

31 March-1 April 2009: Brainstorming Workshop - The Doha Round: Securing Development Outcomes for Small Economies and LDCs, held in Hampshire, UK

6-7 February 2009: High-Level Conference on Financial Crisis, Global Economic Governance and Development, held in New Delhi, India

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