Regulating for Climate Change in Developing Countries: Appropriate Regulatory Strategies in the Context of Technology Transfer

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This paper takes the discussion about legal tools in the context of climate change beyond the focus on intellectual property law to direct attention instead to the importance of regulatory frameworks within developing countries themselves. Our contention is that access to technologies represents only half the picture, with the other half concerning absorption of those technologies at the domestic level. In particular, we take what is known about the design of effective regulation in Europe and the little that is known about effective regulation in developing countries in the context of environmental law, and sketch out how this might apply to the broader end of creating a legal toolbox in the context of climate change.

1. Introduction

This short paper takes the discussion about legal tools for technology transfer in the context of climate change beyond the focus of intellectual property law, directing attention instead to the importance of regulatory frameworks within developing countries themselves. Access to technologies is only half the picture.[1] The take-up of technology is the other half of the picture, and the ability of a country to do so successfully will depend on a number of factors. Where a developing country has access to technology (green or otherwise), there are any number of barriers that may prevent its effective utilisation within a developing country, even where there is willingness to do so. It is for this reason that we have chosen to focus on the receiving country and to look beyond intellectual property law to the design of regulation within developing countries. In particular, we take what is known about the design of effective regulation in Europe and the little that is known about effective regulation in developing countries in the context of environmental law, to sketch out how this might apply to the broader end of creating a legal toolbox in the context of climate change. Part of our response to the questions posed by this conference concerning the creation of the best legal environment for the design of technologies to combat climate change is that such 'technologies' must include regulatory techniques and simple environment law.

2. Taking a developing country perspective

Those working on development-related issues understand that efforts to tackle climate change will need to take due account of the specific context and needs of developing countries.[2] Even more specifically, a focus on the ability to take up technologies and regulatory techniques in the context of tackling climate change will require attention to the particular regulatory system within individual developing countries. Success in assisting developing countries in adapting to climate change will therefore require those concerned to take account of political, geo-political, environmental and administrative differences in each and every country.[3] Yet, while there is an inherent danger in referring to 'developing countries' of failing to take account of these specificities, there is sufficient commonality nonetheless in the types of problems they face to make a generalised approach worthwhile, at least in suggesting indicators to be applied in the context of the specific situation. There are two main elements

that need to be considered in taking a developing country perspective. The first concerns the importance of taking the development needs of developing countries into consideration when designing regulation that either protects the environment or aims at creating the context for the absorption of transferred technology (whether green or not). Taking such broader development needs into account is vitally important for the success of global adaptation or mitigation efforts, not least because climate change imposes an additional burden to development but also given that the majority of those worst affected by climate change will be located in those countries least able to cope with the extra demands.[4] What this requires will vary in practice, but we would suggest that it includes a mind-set that understands efforts at adaptation to climate change as part of a country's wider development agenda. One part of doing this in regard to the design of regulation will be to take account of the notion of the 'developmental state' i.e. the idea that developing states may require a particular legal and administrative configuration in order to kick-start economic growth – a configuration centred on a strong state. This idea does not sit well with the predominant neo-liberal approach to the interaction between the state and markets.[5] Another aspect, particularly in relation to technology transfer, concerns the nature of the technology itself, which must be suitable to the developing country context. There is considerable empirical evidence to suggest, for example, that high-labour and low-capital technologies are best suited to development needs, by providing more employment and greater value-added to communities.[6] The design of technology for mitigation or adaptation in the context of climate change will therefore need to be designed with developing countries in mine; as the green technologies likely to suit the needs of the developed world – low-labour, high-capital – are likely to undermine development efforts elsewhere. Despite the importance of a development-facilitating approach, however, we do not have space to give further consideration to this requirement here.[7]

The second main element in a developing-country perspective concerns the particular administrative and legal context of developing countries in relation to designing regulatory tools and techniques to assist in combating the effects of climate change. In recent years, the law and economics literature has provided a detailed analysis of the conditions and consequences of the limited governance capacities prevalent in many developing countries. This literature has identified low administrative capacity and corruption as two of the biggest problems facing developing countries in their efforts to implement laws designed to facilitate economic growth, problems that will certainly affect these countries' ability to respond effectively to climate change. Recent additions to this debate have suggested that, although the low effectiveness of regulation is frequently a consequence of a desperate economic situation as much as it is a cause thereof, the quality of the regulatory framework is an important stand-alone factor in determining regulatory effectiveness that is independent of standard measures of development, such as national income.[8] What this means is that the design of environmental regulation has an equally large impact on the effectiveness of environmental regulation and hence upon developing countries' ability to respond effectively to the threats posed by climate change. The example of environmental law suggests that for regulation in developing countries to be effective, it needs to take into account limited administrative capacities, the degree and prevalence of corruption and other relevant factors, such as the reach of informal law or the distribution of power between the centre and

localities, in its design. Regulation is thus more likely to be effective where it is designed specifically to function under such (non-ideal) conditions.

3. Lessons from Europe

The lessons of European attempts at environmental regulation provide some helpful clues about regulatory design. Our perhaps counter-intuitive suggestion is that, despite the limited resources of state regulators, command-and-control legislation better connects with the regulatory environments that characterize developing countries than contemporary alternatives emphasizing 'governance' and 'responsiveness'.[9] In this section we further elaborate on this premise by examining important experience gained at the domestic level since the European Union first embarked upon an environmental policy in the early 1970s.

Although perhaps hard to imagine in 2010, countries like Spain and Portugal did not have anything even remotely resembling ministries for the environment when they first acceded to the Union; the same applies to some of the central and eastern European countries that joined more recently. EU experience gained with past accessions of Member States with under-developed administrative traditions provides valuable lessons for developing countries. In this section, we focus in particular on two inter-related challenges that together in good part determined the effectiveness of environmental regulation, or lack of it, in the European Union in general, and in the accession countries in particular.

The first challenge concerns the choice of environmental standard. The second concerns the implementation and enforcement of the chosen environmental standards, which inevitably requires the involvement of public authorities to a greater or lesser extent.

A. Environmental standards: basic rules of thumb

There is a more to be said about environmental standards than is feasible in the context of this short article, but in essence the crucial choice facing regulators is between adopting relatively crude standards that are administratively simple to fix and to enforce, and sophisticated standards that require much higher levels of scientific and administrative expertise.[10]

This choice pertains to the level of environmental protection those standards ought to reflect, as well as the form those standards ought to take. As for the form of regulations, in the pursuit of combating climate change regulators may adopt product standards, process standards, emission standards, or ambient quality standards. We argue that for developing countries, process and ambient quality standards more often than not will be *prima facie* unsuitable.[11]

Standards are crude when they relate to the environmental performance of products (product standards) or industrial installations (emission standards) without having regard to the receiving environments (water, air, soil) they are intended to protect. By way of example, emissions by diesel-engines have been regulated (product standards) without regard to the impact of the sum-total of the growing number of diesel-engines on climate change.[12] Similarly, for discharges of toxic, bio-accumulative and persistent heavy metals into the aquatic environment, maximum concentrations (emission values) have been fixed without specifying a ceiling for the rivers, lakes and seas in which those substances are discharged.[13] In such cases, regulation may be either under-inclusive or over-inclusive, but in any event is almost certain to be

sub-optimal relative to the environmental goals it is intended to serve.

Within the EU, there has been a conscious policy to replace the crude standards of the 1970s and 80s relating to discharges in water and air with much more sophisticated alternatives tailored to ecological quality objectives. Again by way of illustration, instead of substantively regulating the quality of discharges, the Union has moved towards procedurally regulating the ecological quality of river basins in a 'river basin management plan'.[14]

Whereas such more sophisticated approaches may address the problem of sub-optimal regulation, this comes at a hefty price. Even for a highly developed polity such as the EU, it is proving a tall scientific and administrative order to quantitatively express ecological quality, let alone translate that generic standard into a level for individual discharges. Obviously, monitoring compliance with simple emission values that concern the quality of individual discharges of point sources is also considerably easier than having to police, for instance, entire river basins or areas of air space. Indeed, one of the most attractive features of crude standards is that they are enforceable.

In summary, if there is a single lesson that should be learned from EU experience it is that, when it comes to standards, it is imperative to know how to walk before attempting to run. Crude standards that are about right are therefore more effective in ensuring environmental protection, albeit imperfectly, than sophisticated standards that may turn out to be precisely wrong or impossible to monitor and enforce. We turn to the issue of enforcement next

B. Public and private enforcement

Where deficits in public know-how, capacity or commitment to implement and enforce environmental standards go unaddressed, the standards adopted will not effect improvements in the environmental performance of firms.[15] Early common law examples of environmental law apart, the enforcement of environmental law is traditionally entrusted to some kind of public authority. This is in good part because the scope of personal rights and remedies is too restricted to serve the enforcement of contemporary environmental laws regulating the oceans, the atmosphere, habitats and other common goods.

Effective enforcement (which in this context we understand as securing compliance with legally prescribed standards) first of all implies that breaches of the law are detected. As we observed above, depending on the nature of the standards that are at stake, this will require different degrees of administrative sophistication on the part of the enforcement agency.

Presuming that regulators have wisely opted for crude standards, breaches of which are more easily detected, enforcement agencies are still likely to lack the resources needed to systematically detect those breaches. Within the EU, initiatives to offset this problem by mobilizing the vigilance of private individuals have been really successful only in respect of legislation protecting birds and habitats.[16] This success is due mainly to the fact that destructions of habitats are of course easy to detect, but also because well–funded and well-staffed NGOs have not shied away from starting costly litigation to enforce the law.

Although similar successes have not been registered in respect of other important elements of the environment, initiatives that require the establishment of publicly accessible registers

detailing the environmental performance of firms are nonetheless important. This is because, apart from the detection of breaches, effective enforcement of environmental standards also implies that public authorities take action to persuade or compel firms to comply.

Literature on the enforcement of environmental law shows that it is important that the law allows enforcement agencies to discriminate between the cynical calculating perpetrator of an environmental wrong, which calls for coercive action, and the incompetent law-breaker, who needs education and persuasion.[17] Obviously, this implies considerable discretionary powers on the part of enforcement agencies, in turn inviting abuse and capture. Publicly accessible registers are important because they allow for the public, or civil society, to exercise a supervisory role.

Finally, persuasive approaches can only be expected to result in higher long-term compliance levels if recourse to dissuasive and deterring coercive measures is available and realistic.[18] Within the EU, this last insight has resulted in the adoption of legislation compelling Member States to resort to criminal law for the enforcement of environmental crime.[19] Given that this legislation was adopted specifically in response to the accession of central and eastern European states that did not have the administrative traditions to deal effectively with major breaches of environmental law, there is every reason to assume that criminal environmental law could be equally important for the developing world.

4. Designing effective regulation in developing countries

Given the limited space here, it is only possible to state the indicators suggested by earlier research by one of the current authors, in collaboration with others, for the design of effective regulation in developing countries.[20]

The first indicator concerns the definition of effectiveness. While effectiveness will clearly be determined by whether the regulatory regime succeeds in assisting a country in the achievement of its goals in accessing and absorbing the necessary technology to combat climate change, those goals must be set by the countries themselves. The effectiveness of regulatory reform therefore turns on whether it fixes problems and achieves goals set by governing authorities of developing countries, *including* development goals. This suggests that developing countries may seek a different balance between environmental protection and economic growth. In sum, effectiveness should not be determined by the parameters of economic theory or Northern-derived standards of good governance.

The importance of developing countries setting their own goals determines the second indicator as well. Any form of regulation is political, and regulation aimed at balancing the protection of the environment with overall development goals is particularly so as it is likely to entail re-distribution between groups in society. For such regulation to be perceived as legitimate by those whom it purports to govern, there needs to be open recognition of the political nature of regulation aimed at adapting to climate change and an opening up of the process of decision-making to contestation by those likely to be negatively affected (although this last point must be read in conjunction with the fourth indicator, below.

The third indicator builds upon research in the field of law and economics specifically focusing on developing countries. This research suggests that where governance capacity is weak, it is better to avoid legal instruments that require high levels of administrative capability to be effectively implemented. Contrary to theory

based upon Northern models, for developing countries setting out precise rules in legislation is more likely to be effective than flexible instruments containing vague standards. Fixed rules have lower implementation and compliance costs than variable standards, thus making them more suitable in systems with low capacity; in leaving little scope for discretion, fixed rules are also less vulnerable to corruption at the implementation stage.[21]

The fourth indicator suggests that a centralised command-and-control type regulatory framework is more likely to be effective where capacity is weak. This finding flagrantly contradicts the trend in governance thinking in developed countries towards decentralised decision-making processes. While there are obvious apparent benefits to locating decision-making closer to the people it affects, the risk of capture by local elites and corruption among officials are generally higher at the local level than at the centre.[22] Similarly, whilst open public participation in decision-making is also widely viewed as a good thing for obvious legitimacy-based reasons, where corruption is primarily opportunistic, public participation may actually provide greater scope for corruption by providing the opportunity for contact between officials and those who are to be regulated.[23] However, where corruption is endemic, transparency in decision-making and the active participation of civil society actors in the processes of regulation are more likely to work to reduce corruption.

However, the fifth indicator provides that the most suitable location of decision-making is not so straightforward as the fourth indicator suggests. Decision-making tends to be most efficiently located at the central level because it is more cost effective and thus better suited to situations in which administrative capacity is weak and resources are low; and because centralised government structures are more likely to have the tools and resources to ensure implementation, and less likely to face capture by lobby groups or local elites. However, that said, determination of the most suitable location of regulatory decision-making will be affected by the relative levels of corruption at the local and central levels. Where, for example, corruption is endemic within the central government, it may well be more effective to de-centralise decision-making processes, regardless of whether it is less cost-effective.

These indicators are obviously broad prescriptions for how to go about designing regulation in developing countries; the most effective combination of indicators will depend upon the conditions at work in a particular country. But what to do they tell us about regulation in the context of climate change?

5. Lessons for regulation in the context of climate change

The first broad point to note is that the research upon which the suggestions here are based indicates that theories and modes of regulation that are developed in the global North are unlikely to be effective when transplanted to developing countries, where administrative and systemic conditions as well as priorities are likely to be very different. This has important implications for the regulatory instruments most associated with combating climate change, such as environmental taxes and tradable emission rights.[24] These 'smart' environmental instruments are flexible and vague, and thus rely heavily on administrative capacity and a strong public interest ethos within the administration for effective implementation. They also rely upon strong scientific knowledge to set the standards at the right level and to monitor compliance. They are thus unsuitable in design for countries

that struggle with limited resources, weak administrative capacity and corruption. A global system of tradable emission rights that does not take the conditions of developing countries into account is unlikely to function successfully, for example. Similarly, environmental taxes that require civil servants to set and collect the income are unsuited to a corruption-rich environment. The indicators presented here suggest that a rule-based instrument containing firm prescriptions set and enforced at the central level is more likely to be effective in the developing country context. Moreover, lessons from Europe suggest that these rule-based instruments should be backed up by clear and dissuasive criminal sanctions. Yet these findings dramatically contradict the types of instruments currently promoted for climate change mitigation and adaptation.

In the context of technology transfer, our research further suggests that the design of regulation to facilitate international technology transfer within developing countries needs to be country specific and take account of different levels of development by following the indicators outlined above. This will affect not only the priorities of a given country but also the resources available for regulatory implementation and enforcement. Climate-change related international technology transfer thus needs to be situated within the broader development agenda as both the environmental and political effects of climate change will play out differently in each country. For example, the need to address the effects of climate change will affect the setting of priorities differently in a small island nation, vulnerable to rising sea levels and dependent upon tourism, compared to a member of the BRIC grouping.[25] Within this context, consideration should ideally be given in least developed countries to the preference for technology that is high labour/ low capital, not only for the direct contribution such technology is likely to make towards development goals but also for the indirect contribution of spill-over effects from the transferred technology, which are more likely to occur where the technology concerned is appropriate to the general level of economic development.[26]

More particularly, a command-and-control type of approach is more likely to be suitable to a regulatory framework aimed at fostering international technology transfer; and the choice as to where to locate decision-making processes should be informed by questions of cost effectiveness and administrative capacity as well as the relative risks of corruption and/ or capture, rather than by Northern ideas of efficiency or of good governance norms.

In sum, what we know about effective regulation in the area of environmental law can, and more importantly *should*, inform efforts at developing regimes for the international transfer of technology in the context of combating the effects of climate change in developing countries. Where efforts are focused solely at the level of removing barriers to International Technology Transfer at the international level or where the technology itself is designed for developed country circumstances, greener technology will fail to be absorbed at the national and local level in developing countries. Likewise, where we rely upon regulatory instruments designed to suit the regulatory conditions of the global North as a template for the creation of a legal toolbox to tackle climate change, the results are likely to be disastrous – not simply in terms of effectiveness but in real terms as measured by the lives devastated by unmitigated climate change effects. While there remains much that we do not understand about creating the conditions for absorptive capacity, we do know how to design regulation likely to be more effective. What we have attempted to do within the limited space

here is give notice that the dominant regulatory approach at the global level to tackling climate change seems to be the wrong one; to be properly inclusive and relatively effective, it needs to be designed to take account of the regulatory weakness of developing countries and not the regulatory strengths of the developed world.

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[1] A detailed study on the workings of technology transfer in the context of the Montreal Protocol on CFCs suggests that intellectual property law in fact did not constitute a significant barrier for developing countries; see Stephen O. Anderson, K. Madhava Sarma and Kristen N. Taddonio, *Technology Transfer for the Ozone Layer. Lessons for Climate Change* (London: Earthscan, 2007). How pertinent such observations are in the context of climate change, given the likelihood that new green technology will be more sophisticated and more expensive to develop, is difficult to assess; yet even where access to such technology does constitute a barrier to technology transfer, it still only constitutes part of the equation.

[2] World Bank, *Development and Climate Change*, World Development Report 2010, Washington D.C.

[3] See *Technology Transfer for the Ozone Layer* (2007), op cit. and *Development and Climate Change*, ibid.

[4] World Bank (n. 2) chapter 1.

[5] See, e.g., Tom Ginsburg, 'Does Law Matter for Economic Development? Evidence for East Asia', 34 *Law and Society Review* 829 (2000). Also Joseph Stiglitz, *Making Globalization Work* (Penguin, 2006).

[6] See Jeffrey James, *Technology, Globalization and Poverty* (Cheltenham: Edward Elgar: 2002), 71-111, examining what he terms pro-poor modes of technical integration into the global economy.

[7] A good starting point in this literature is Ginsburg (n. 2).

[8] See for an excellent summary of this literature in relation to environmental law, Dan C. Esty & Michael E. Porter, 'National Environmental Performance: an Empirical Analysis of Policy Results and the Determinance', 10 *Environment and Development Economics* 391–434 (2005).

[9] We use the term 'responsive regulation' in a very broad fashion to embrace notions of deliberative democracy, and the intelligent employment of actors and tools to enhance or substitute public regulatory capacities. See in similar vein, J. Braithwaite, 'Responsive Regulation and Developing Economies' (2006) 34 *World Development*, 884.

[10] H. Somsen, 'Current Issues of Implementation, Compliance and Enforcement of EC Environmental Law: A Critical Analysis' in L. Krämer (ed.), *Liber Amicorum Gert Winter* (Groningen: Europa Publishing, 2003), 415-28.

[11] For arguments that *a fortiori* apply to developing nations, see H. Somsen, 'Current Issues of Implementation, Compliance and Enforcement of EC Environmental Law: A Critical Analysis' in L. Krämer (ed.), *Liber Amicorum Gert Winter* (Groningen: Europa Publishing, 2003), 415-28.

[12] Council Directive 88/77/EEC relating to the measures to be taken against the emission of gaseous pollutants from diesel engines for use in vehicles (OJ 1988 L 36).

[13] Directive 76/464/EC on Dangerous Substances Discharged into the Aquatic Environment (OJ 1974 L 129).

[14] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (OJ 2000 L 327).

[15] See for example H. Somsen, discretion of Member States in European environmental law: H. Somsen, 'Discretion in European Community Environmental Law' *Common Market Law Review* 40 (2003) 6, p. 1413-53. See also H. Somsen, 'The Private Enforcement of Member State Compliance with EC Environmental Law: an Unfulfilled Promise?', (2000) 1 *Yearbook of European Environmental Law*, 311-60.

[16] H. Somsen, 'The Private Enforcement of Member State Compliance with EC Environmental Law: an Unfulfilled Promise?', (2000) 1 *Yearbook of European Environmental Law*, 311-60.

[17] K. Hawkins, *Environment and Enforcement* (Oxford: Clarendon Press, 1984).

[18] I. Ayres and J. Braithwaite, *Responsive Regulation: Transcending the Regulatory Debate* (Oxford: Oxford University Press, 1992).

[19] Directive 2008/99/EC on the protection of the environment through criminal law, OJ 1998 L 328/28.

[20] The findings in this section are taken from Michael Faure, Morag Goodwin & Franziska Weber, 'Bucking the Kuznets Curve: Designing Effective Regulation in Developing Countries' (2010) 15 *Virginia Journal of International Law* (forthcoming). This article details the process of development of the indicators.

[21] See Anthony Ogus, 'Corruption and Regulatory Structures', (2004) 26 *Law and Policy* 229-246; Anthony Ogus, 'Regulatory Arrangements in Developing Countries', in: Eger, T., Bigus, J., Ott, C. & Von Wangenheim, G., *Internationalisierung des Rechts und seine*

ökonomische Analyse/ Internationalization of the law and its Economic Analysis, Festschrift für Hans-Bernd Schäfer zum 65. Geburtstag (Wiesbaden: Gabler, 2008), 721-734.

[22] R.L. Revesz, 'Federalism and Environmental Regulation: an overview' in *Environmental Law, The Economy and Sustainable Development* 37–79 (Richard L. Revesz, Philippe Sands & Richard B. Stewart eds., Cambridge University Press, 2000); and R.L. Revesz, 'Federalism and Environmental Regulation: Lessons for the European Union and the International Community', (1997) 83 *Virginia Law Review* 1331.

[23] A. Ogus, 'Regulatory Arrangements in Developing Countries' *in Internationalisierung des Rechts und seine Ökonomische Analyse* 721–734 (Eger, Bigus, Ott, & Von Wangenheim (eds.), Festschrift für Hans-Bernd Schäfer zum 65, Geburtstag, Wiesbaden: Gabler, 2008).

[24] See Global Environment Outlook (GEO) 4, 2007, by United Nations Environment Programme (UNEP), available at http://www.unep.org/geo/geo4/report/GEO-4_Report_Full_en.pdf, pp. 30 (particularly the charts). Among the variety of economic instruments suggested are property rights, market creation, fiscal instruments, charge systems, financial instruments, liability systems, bonds and deposits. Similarly, *see* the UNEP Guidelines on Compliance and Enforcement of Multilateral Environmental Agreements http://www.unep.org/dec/onlinemanual/Home/tabid/36/Default.aspx and http://www.unep.org/dec/onlinemanual/Enforcement/InstitutionalFrameworks/EconomicInstruments/tabid/88/Default.aspx (especially guideline 41(g)). See also *World Bank Development Report 2010: Development and Climate Change*, Washington, 2009 for the suggestion of smart instruments in developing countries, despite an awareness of the capacity and resource challenges such countries face.

[25] BRIC stands for Brazil, Russia, India and China, although some also speak of a BRIIC group that includes Indonesia. 'Everybody's friend. Indonesia deserves a better image', *The Economist*, 10 September 2009.

[26] E. Kesidou & A. Szirmai, 'Local Knowledge Spillovers. Innovation and Economic Performance in Developing Countries: A Discussion of Alternative Specifications', UNU-MERIT Working Paper 2008-033.