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*INNOVATION AND DEVELOPMENT IN THE AGE OF CLIMATE
CHANGE ADAPTATION: OPEN OR CLOSED?*

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SHARED PROBLEM

We share the problem of how to adapt to climate change. Our brief in this conference contends that there are a plethora of reasons for Africa being thrown deep into poverty, one key factor is isolation, and suggests that if Africa were to be more integrated into the world economy, most African economies would be able to enjoy the benefits of international economic law. If that is so, then in the area of intellectual property rights (IPRs), what is there to do? What can be gained from the legacy of global north IPRs for the global south development?

I consider IPRs as a tool kit, discuss the limitations of patents, and the value of trademarks in the service of creating an open innovation mode that embraces traditional and indigenous values and is inclusive of all intellectual assets available.¹

INNOVATION IS NECESSARY FOR DEVELOPMENT

Innovation is the ability to solve problems. Invariably the solution to a new problem is an innovation, if nothing else, because the problem itself is novel. Consequently, innovation is required to solve local problems of development while climate change adaptation is a fact on the ground that stresses all existing development approaches.

Without a doubt, innovation is necessary for development. This innovation will take many forms. Innovation in its broader sense encompasses social, institutional and governance aspects, policy, not just technology. Innovation ought to serve to solve problems in a sustainable and equitable way.

¹ The expression of *intellectual assets* is introduced to designate any tacit or codified knowledge. That is when we speak of intellectual assets these could be codified in the form of a patent, technical description, or it may be in the form of non-coded traditional or indigenous knowledge.

IMPLICIT ASSUMPTIONS

A first assumption, especially as the Paris Convention or the TRIPS Agreement were negotiated, is that products are mass produced in industrial settings, not in artisanal, communal or rural settings that incorporate traditional, indigenous or social knowledge. A second one is that the creator can be easily assigned or named, be it as inventor or as an author of a work. A patent distinguishes between inventor and owner of the invention, and requires that both be named. A third is that invention is singular and it does not happen independently in communities or by individuals who are not in communication. In addition, inherent to the patent system is that it was conceived to protect relatively simple mechanical inventions.

These assumptions occurred as a result of the historical context that led to the negotiation of these IP treaties, thus they reflect the understanding and technology of the times. In hindsight, these assumptions are problematic. As the IP regime and its IPRs developed, the system began to increasingly show more serious strains, some of which are known as either patent, or copyright wars. The issues of illegal copying of software and counterfeiting follow as a result of not examining the implicit assumptions and their consequences as technology develops.²

DEVELOPMENT IN THE ABSENCE OF AN INDUSTRIAL PAST

In coping with climate change adaptation developing countries including least developed countries (LDC) will need to do their own conception of development. Facing climate change adaptation in the global south without more than a century of industry offers a totally different starting point from that of the industrialized global north that faces a different kind of challenge, mitigation. One view is that unlike early industrializing countries in the nineteenth century, twenty-first century developing countries ‘can no longer utilize weak IPRs protection to facilitate rapid industrial development.’³ I take the case that adaptation to climate change is not necessarily best met with rapid industrial development, rather with sustainable endogenous

² For clarity I would like to restrict the use of the word counterfeit to its common meaning of ‘fake, forgery, or bogus.’ A counterfeit drug or biotech seed is one that does not contain what it claims to contain. It is unfortunate that IP lawyers rarely make the distinction between patent law infringement, and forgery. The latter is a criminal act, regardless of its status with respect to patent or trademark law.

³ Bryan Mercurio, “Intellectual Property Rights, Trade, and Economic Development,” in *Law and Development Perspective on International Trade Law*, ed. Yong-Shik Lee, Gary Horlick, Won-Mog Choi, and Tomer Broude (Cambridge University Press, 2011).; at 60.

development, and the case for weak IPRs may or may not hold on the ground in a specific community anywhere in the world. It will depend on the community and on the circumstances.

What we may all agree on is that any development approach should be formulated taking into account the intentions expressed in Article 7⁴ and 8⁵ of the TRIPS Agreement. In this spirit there are four areas that offer flexibilities and take advantage of the existing IPRs as a means to an end. These are: patent protection; exhaustion of IPRs; exceptions to owner rights and transfer of technology; and competition issues.⁶ In addition, I offer the concept of leveraging legacy IPRs and knowledge. To leverage legacy IPRs and knowledge it is necessary to understand ‘the interfaces between the formal IP system and customary legal systems which apply to traditional knowledge in local and indigenous communities’⁷ but also to understand the creation, transmission, and cultivation of knowledge. Moreover, I offer that what needs to be understood is the difference in what constitutes knowledge and what the limits of knowledge codification are. Knowledge is much broader in scope than IPRs which are limited to that part of knowledge, a small fraction, which can be codified or made representable.

Let’s take the example of a fictive innovation that incorporates a mechanical invention, and a quantum of traditional or indigenous knowledge and was created by a group of individuals. How would you protect it? A patent would protect the invention expressed as an embodiment of the application of specific laws of nature, but how would you deal with the quantum of traditional knowledge. The laws of nature are

⁴ Article 7: The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

⁵ Article 8 (1) 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. (2) Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.

⁶ Supra note 3 at 62-71.

⁷ Pamela Andanda, “Striking a Balance Between Intellectual Property Protection of Traditional Knowledge, Cultural Preservation and Access to Knowledge,” *Journal of Intellectual Property Rights* 17 (2012): 547-58.

knowledge which we consider to be in the public domain. What is not clear at this point is if traditional knowledge is an expression of laws of nature that are not codified, or if it is technical knowledge (the application of the laws of nature) that its original community has developed and guarded. Possibly, traditional knowledge is a combination of both. That is, traditional knowledge it is both scientific knowledge and technological knowledge all of which has not been codified and thus resides within its community of origin. The question remains on how to proceed with that part of traditional knowledge that is technical in nature. The argument that this technical knowledge is ‘not free to be used and consumed’ is one that only those in its possession can make.⁸ In this fictive example, the patent would require complete disclosure of the technical teachings of the invention, thus it may be ill suited for such a fictive chimeric invention where one part of its technical teachings are the property of a group with the prerogative to keep it secret.

When information is open, processes are transparent, and the community is fully engaged, then creativity can unfold, and the solutions to problems can be found. It is conceivable to consider in such a scenario of open innovation, an open information system that is specific to the community and the creation of an *ad hoc* contractual or social norm that will allow for its development.⁹ If the innovation has a market potential, such as the case of *Hoodia*,¹⁰ fighting forged products claiming to contain its active ingredient¹¹ could be left to a registered trademark. This approach is however not novel.¹² One view is that ‘many grassroots innovations which are not

⁸ One suggestion is that traditional knowledge and trade secrets have much in common, albeit trade secrets are restricted to commercially valuable information: SR Munzer, and K Raustiala, “Uneasy Case for Intellectual Property Rights in Traditional Knowledge, the,” *Cardozo Arts & Entertainment Law Journal* 27 (2009): 37-97.

⁹ An open system in a development community does not imply that the knowledge that it uses is put into the public domain.

¹⁰ Rachel Wynberg, “Policies for Sharing Benefits From Hoodia,” in *Indigenous Peoples, Consent and Benefit Sharing*, ed. Rachel Wynberg, Doris Schroeder, and Roger Chennells, Springerlink.Com (Dordrecht: Springer Netherlands, 2009); I Vermaak, et al., “Hoodia Gordonii: An Up-to-Date Review of a Commercially Important Anti-Obesity Plant,” *Planta Medica* 77, no. 11 (2011): 1149-60.

¹¹ Ilze Vermaak, and Alvaro Viljoen, “Fight Fair in the Fight Against Fat: “Real” Versus “Fake” Hoodia,” *sapj.co.za*, <http://www.sapj.co.za/index.php/SAPJ/article/viewFile/1401/2119> (accessed 28.1.2013).

¹² Anna Taylor, et al., “Technologies for Adaptation,” *Tiempo*, <http://weadapt.org/knowledge-base/community-based-adaptation/technology-and-adaptation> (accessed 2.8.2012). In this article the argument is that technologies for adaptation require more emphasis on processes and institutions than on hardware and give concrete field experience reports of the difficulties of over-emphasis on technology.

being valued enough today but their value may be realised when the sustainability crisis becomes very severe.’¹³

CLIMATE CHANGE ADAPTATION, HUMAN RIGHTS, AND IPR

The populations most vulnerable to the detrimental effects of global warming reside in LDCs and small island States.¹⁴ If adaptation to climate change is to benefit to any degree from technology transfer, then intellectual property, especially in the case of patents and technical capacity building, may have an important role to play. In meeting the costs of adaptation to the adverse effects of climate change, developed countries take full account of the specific needs of the LDCs in funding and transfer of technology.¹⁵

Renewable energy generation, and climate change and adaptation in agriculture dependence on technology transfer and innovation is an issue of debate where solutions are needed. If the setting for climate change adaptation is one of development, then one first needs to explore the relevant fundamental rights of those most affected. Here we note that the UN Declaration on the Right to Development states that ‘the human person is the central subject of development and should be the active participant and beneficiary of the right to development.’¹⁶ Furthermore the International Covenant on Economic, Social and Cultural Rights (ICESCR) codifies scientific freedom, freedom of research and a person’s right to benefit from protection of moral and material interests resulting from any scientific, literary or artistic production of which he is the author.¹⁷ While the rights of individuals are important

¹³ Anil K Gupta, “Innovations for the Poor By the Poor,” *International Journal of Technological Learning, Innovation and Development* 5, no. 1 (2012): 28-39. Gupta advocates going beyond the conventional organisations, disciplines sectors and pedagogies and to look for ‘platforms that link creative but economically disadvantaged people to learn from sustainable solutions developed at grassroots globally.’

¹⁴ Philipp Aerni, et al., “Climate Change and International Law: Exploring the Linkages Between Human Rights, Environment, Trade and Investment,” *German Yearbook of International Law* 53 (2010): 139-88.

¹⁵ Art. 4(4) and (9) UNFCCC.

¹⁶ Declaration on the Right to Development, UNGA Res 41/128 (4 December 1986) UN Doc A/RES/41/128, Art. 2(1); Human Rights Council, Reports of the Office of the High Commissioner for Human Rights on the relationship between climate change and human rights, UN Doc A/HR/10/61(2009), para. 87.

¹⁷ Walter Kälin, and Jörg Künzli, *The Law of International Human Rights Protection* (New York: Oxford University Press, 2009), 410-412; International Covenant on Economic, Social and Cultural Rights, UNGA Res 2200A (16 December 1966) Article 15:

1. The States Parties to the present Covenant recognize the right of everyone:
(a) To take part in cultural life;

and are well developed, collective rights of whole communities have only two main legal instruments at their disposal: the ILO Indigenous and Tribal Peoples Convention No 169 of 27 June 1989, and the UN Declaration on the Rights of Indigenous Peoples (DRIP).¹⁸ Also worth noting is the wording in DRIP Article 29 that affirms the right “to the conservation and protection of the environment and productive capacity of their lands or territories and resources.” This is particularly relevant to climate change adaptation where the major issue is to maintain the productive capacity of the lands.

It has been asserted that access to proprietary IPR for low carbon technologies is of central concern if sustained ‘low carbon technological development is to be achieved’ and that technology transfer remains ‘a central dividing point between many developed and developing countries’ in the UNFCCC negotiations.¹⁹ While there is no doubt that this is an issue of contention, one must distinguish here between the northern understanding of technology diffusion and that of technology transfer and development. Technology diffusion is of particular relevance among industrialized nations concerned with mitigation, or between those with similar social

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- (b) To enjoy the benefits of scientific progress and its applications;
 - (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.
 - 2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for the conservation, the development and the diffusion of science and culture.
 - 3. The States Parties to the present Covenant undertake to respect the freedom indispensable for scientific research and creative activity.
 - 4. The States Parties to the present Covenant recognize the benefits to be derived from the encouragement and development of international contacts and co-operation in the scientific and cultural fields.

¹⁸ See note 17, 378-380. United Nations Declaration of the Rights of Indigenous Peoples, UNGA Res 61/295 (13 September 2007), Article 31:

- 1. Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.
- 2. In conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

¹⁹ D.G. Ockwell, et al., “Intellectual Property Rights and Low Carbon Technology Transfer: Conflicting Discourses of Diffusion and Development,” *Global Environmental Change* 20, no. 4 (2010): 729-38.

and economic development status. The two situations are however quite different, mainly because the absorptive capacity is quite different.

One of the open questions in the development scenario remains that of how to square off the legacy of IPR system with the emerging adaptation needs of the global south.²⁰ Sustainable endogenous development is suggested as a necessary principle for adaptation to the consequences climate change which brings rapid changes to ecological systems thus upsetting their delicate dynamic equilibria established during periods of extended climatic stability. When the pace needed to adapt is accelerated, it is the community most affected that has all the motivation and the better knowledge to innovate and create adaptive solutions. To create these solutions, the legacies of traditional and modern knowledge creation, dissemination, transmission and application need to be interwoven into a new cultural fabric of inclusive development.

CONCLUSIONS

The take home lesson is that to make innovation happen in the global south, in particular innovation that addresses the challenges of climate change adaptation, what is needed is to consider traditional and indigenous know how together with open innovation, open source hardware (and software), and legacy intellectual property tools to mobilize all at the grassroots in an approach called sustainable endogenous development. International economic and human rights law provide abundant policy space for such a course of action. The future is for those who make it happen. China, but also New Zealand, Denmark, Finland and Sweden have shown success stories of catch-up growth that acquires and applies knowledge and take trade to be a means to achieve the sought after goal of national development.²¹ This is neither a blank endorsement of China or New Zealand's development policies, but a reminder that in their innovative approaches that left neo-liberal economics unattended, there is a lesson or two in policy innovation to be learned. When it comes to IPRs, my modest recommendation is to think in terms of intellectual assets that can be leveraged as needs occur. Given that climate change adaptation will necessarily require all the

²⁰ One may also ask the question of whether it will be possible to leapfrog the development of the global south by considering measures of climate change adaptation within a framework of sustainable endogenous development.

²¹ Aerni argues the role of the non-rival input *knowledge* plays in economic development and its contribution to sustainability: Philipp Aerni, "Connecting Catch-Up Growth to Sustainable Development - a New Theoretical Perspective," *ATDF Journal* 8, no. 3/4 (2011): 29-41.

local knowledge available be mobilized quickly, then the road to development may be an open one as discussed by Gupta, but it can capitalize on that intellectual investment by using legacy IPRs.

Finally, I offer an apology and a vision. First the apology. There is an overwhelming amount of literature on innovation, development, trade, and climate change adaptation that has been written in a state of *sans connaissance de cause*. The overwhelming body of literature is what we have in the way of information for the state of the art and as a showcase of what the brightest and best educated minds think or what the problems are and how we could possibly fix them. Almost every essay concludes by pointing out where there is data missing and more questions need to be asked before others can be answered. I apologize for so much ignorance, and I apologize for so much erudition and scholarship. We need solutions that work for the poorest, those at the bottom of the pyramid, and that the question of inclusion in Africa and in the world economy is not just one of connecting the narratives that separate us.

Now for the vision. The vision should come from Africa, not from me or from Western scholarship. That said, it does not mean that the vision should not be informed by Western scholarship, it certainly can offer information and inspiration. The knowledge necessary will need to be synthesized locally. From this perspective what I can offer is limited. I am interested in exploring the protection, development and use of the public domain in service of open innovation and climate change adaptation. I take a view of science, technology and innovation that places these as the result of our cultural heritage, and take a partial view on technological determinism and internet centrism.

From where I stand, Africa for the uninitiated European, needs to be travelled on foot, and with guides who knows its many histories and oratures. Last, but not least, the growing body of international law is a joint cultural enterprise of all peoples. In that body of international law, the IPR tools can either be the sand or oil in the gears, it all depends on how, where and when they are applied.