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Technology Transfer for Climate Change Mitigation: A Perspective from Kenya

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Abstract
The impact of climate change continues to be experienced worldwide. Treaties such as the UN Framework Convention on Climate Change (UNFCCC) of 1992 and the UNFCCC Paris Agreement of 2015 demonstrate the value that UN Member States attach to reaching consensus on climate change mitigation steps. In this thematic report, the author looks at the issue of climate change mitigation technology transfer (TT) from a Kenyan perspective, specifically with reference to Kenya's National Climate Change Action Plan (NCCAP), and to provisions in Kenya's patent law that are relevant to TT licensing agreements between foreign and Kenyan entities.

Keywords
climate change mitigation, greenhouse gases (GHGs), technology transfer (TT), licensing, patents, Kenya

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1. Introduction

It was reported in March 2016 that the average global temperature was 1.28°C warmer than the average temperature for the period March 1951 to 1980 (Silberg, 2016). The 2015-2016 El Nino weather phenomenon, the most intense and widespread in 100 years, has caused drought, floods and extreme temperatures (FAO, 2016). These conditions have affected the food security of an estimated 60 million people worldwide (FAO, 2016).

Climate change is defined under Article 1 of the UN Framework Convention on Climate Change (UNFCCC) as a change of climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods (UNFCCC, n.d.). As a result of the impact of recent alterations in climatic conditions, global attention has been drawn to the possibilities of mitigating such outcomes through various initiatives. The Paris Agreement, adopted at the 21st session of the UNFCCC Conference of the Parties (COP) held in December 2015, is one of these initiatives (UNFCCC, 2015). Kenya ratified the 1992 UNFCCC in 1994 and the 2015 Paris Agreement in April 2016.

The accumulation of carbon dioxide and other greenhouse gases (GHGs) in the Earth's atmosphere has for a long time been known as a factor that can increase the temperature of the planet and consequently lead to natural disasters (UN, n.d.1). The supply and use of fossil fuels by mankind account for 80% of carbon dioxide emissions (UNFCCC, n.d.). Oil, natural gas and coal produce most of the energy required for activities such as electricity production and the running of automobiles (UNFCCC, n.d.). Clearing of forests for agriculture or development also results in the release of carbon into the atmosphere by way of burning or decomposition of trees (UNFCCC, n.d.). Considering the role played by carbon-emitting activities in day-to-day life, the challenge presented by attempts to reduce carbon emissions is clear. The development and use of technologies that achieve reduced emissions of carbon dioxide and other GHGs can be expected to result in the reduction of global warming.

The issue of technology transfer (TT) features in both the UNFCCC and the Paris Agreement. In the UNFCCC, various provisions refer to TT, and cooperation of Member States on TT, in respect of technologies to control, reduce or prevent the omission of greenhouse gases. The Paris Agreement also refers to the element of cooperation among members with regard to TT, in addition to acceleration of innovation, in order to achieve an effective, long-term global response to climate change.

Kenya's National Climate Change Action Plan (NCCAP) 2013-2017 identifies technology development as a key element of mitigation, stating that

> as technology developments have supported Kenya to cope with climate variability in the past, new technologies will continue to pave the way for low carbon climate resilient development in the future. (Government of Kenya, 2013, p. 115)

The NCCAP refers to inadequate access to technology as a barrier to the achievement of optimal environmental conditions. The technology availability gap is a problem in most of Africa, with limited research and development (R&D) capacity (via dedicated R&D centres) identified as a key factor undermining development and market entry of potentially viable locally produced technologies (UNECA, 2014).

Kenya's NCCAP also highlights the need for cooperative action at international, regional and national levels in respect of the intellectual property rights (IPRs) – typically patents – that often underpin protection of technology (and undermine TT). The UNFCCC of 1992 and Paris Agreement of 2015 do not, however, specifically mention IPRs.

2. TT and sustainable development

In the context of climate change, TT has been defined by the Intergovernmental Panel on Climate Change (IPCC) as a broad set of processes – covering the flows of know-how, experience and equipment for mitigating and adapting to climate change – among governments, private-sector entities, financial institutions, non-governmental organisations and research and education institutions (IPCC, 2000).

It has been noted that in Kenya, carbon-producing combustion of wood and charcoal accounts for almost 70% of primary, non-electricity, non-transport energy consumption (Government of Kenya, 2013). In addition to producing GHG emissions, this threatens the existence of the forests, which produce the oxygen that helps to counterbalance greenhouse gases. Meanwhile, agriculture, on which many Kenyans depend for their livelihoods, was responsible for one-third of Kenya's emissions in 2010 (Government of Kenya, 2013).

Various technologies have been identified as relevant to the achievement of a low-carbon development strategy (sometimes referred to as a low-emission development strategy) in Kenya. The concept of low-carbon development has its origins in the UNFCCC of 1992 (UN, 1992). Low-carbon development generally refers to forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth (OECD & IEA, 2010). The technologies identified in Kenya's NCCAP include those for geothermal

generation, wind-power generation, improved charcoal production and restoration of forests (Government of Kenya, 2013, pp. 117-118). The NCCAP calls for such technologies either to be developed in Kenya or transferred to Kenya from other countries (Government of Kenya, 2013, p. 118).

TT can take place in various ways, including via foreign direct investment (FDI), licensing agreements, joint ventures, training, and mergers and acquisitions (Pugatch, 2011). Additionally, in the energy industry, production-sharing contracts have been cited as an effective method of sharing technology (IPCC, 2000). Under such agreements, private firms contract with local parties, usually state-owned companies or governments, to share technology with them in exchange for a share of products (IPCC, 2000).

3. TT and IPRs

The relationship between IPR protection and TT is contentious and unclear. It is argued by some that with the exception of very advanced technologies, firms do not rank IPRs highly among the factors influencing decisions as to whether or not to transfer technology (Hall & Helmers, 2010). Others argue that weak IPR systems lead to lower FDI as a result of the increased likelihood of infringement (see, for example, Javorcik (2004)). Some posit that other elements of a country's regulatory framework, for example taxation and production incentives, also have a strong role to play in determining whether a country is an attractive investment destination for firms (see, for example, Maskus (1998)).

Another argument at play in this issue is that in a significant proportion of green technologies, the underlying technology is not actually under patent (as it is a mature technology) and thus is in the public domain – and, accordingly, most technological progress in this field can be expected to come from incremental improvements to existing off-patent technologies (Hall & Helmers, 2010).

It can thus be argued that for many climate change technologies (i.e., the ones with underlying elements in the public domain), TT does not have to play a key role, as local innovators can forge incremental innovations from public-domain technologies. This argument, however, is dependent on the country in question having the resources necessary to build on the public-domain technologies. Observed from a developing-country perspective, where there is limited capacity for technological advancement, TT will likely still be necessary even in technology areas with a high proportion of existing public domain technological know-how. Indeed, a UN Economic Commission for Africa (UNECA) study – of medical research in Kenya – found that in cases where there was some limited TT flowing into Kenya via staff training by overseas entities (e.g., by the Japan International Cooperation Agency (JICA)), the impact of the TT was undermined by a shortage of multidisciplinary scientists to support product development and commercialisation; by a non-commercially-

oriented research environment; and by a lack of comprehensive policy for sharing revenues generated from research output (UNECA, 2014). The findings of the UNECA study, though focused on the medical research sector, are also likely to be indicative of the state of Kenya's climate change mitigation research sector.

At the same time, emerging economic powers such as China are reported to have significant numbers of patents in clean energy sectors, meaning that in some climate change technology areas patents could present a clear barrier to TT (Consilvio, 2011). This is because it would be necessary for non-patent holders of such technology to seek licences prior to using the technology for commercial purposes, to avoid infringing the patents.

4. KIPI screening of TT licences

Where TT to Kenya involves patented technology, it falls under the Industrial Property Act (IPA), 2001. As a Member State of the World Trade Organisation (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of 1994, Kenya enacted the IPA as a step towards compliance with the TRIPS minimum standards for IPR protection.

The IPA provides in section 5(b) for TT of patented technology, and allocates screening of TT agreements and licences to the Kenya Industrial Property Institute (KIPI). Under section 68(6), only TT licences registered by KIPI have validity.

The IPA's section 69 outlines the terms that are prohibited under TT licences, i.e., the terms, if found to be present in a licence, may bar KIPI registration of the licence. One such prohibited term is one that would enable importation of technology already available in Kenya or substantially similar to technology already available in the country. Another prohibited term is one that would require payment of a fee, royalty or other consideration where the payment/consideration is disproportionate to the value of the technology to which the licence relates. Also prohibited are restrictions on a licensee's use of the technology. In sum, the IPA's section 69 aims to protect Kenyan technology licensees from being exploited by foreign patent holders in TT arrangements; and to protect Kenya's economic interests when existing local technologies make the TT unnecessary.

5. Conclusion

It seems clear that, due to gaps in capacity development and a lack of financial resources necessary to undertake R&D and other activities integral to technology advancement, Kenya's climate change mitigation technology development will, for the foreseeable future, be reliant on TT from other countries.

In this context, KIPI's application of section 69 of the IPA of 2001 will potentially be of great significance. In respect of local licensing of foreign climate change mitigation

technologies, will application of section 69 serve as an enabling mechanism (by ensuring that such licences are crafted in a way that serves local needs), or will it serve as a barrier (by deterring foreign technology providers from seeking licensing opportunities in Kenya)? Questions of this sort will become increasingly important in Kenya in the years to come as the need to make foreign technology available for climate change mitigation grows.

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