



The Intellectual Property Treaty Landscape in Africa, 1885 to 2015

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Abstract

Intellectual property (IP) policy is an important part of economic growth and human development. International commitments harmonized in intellectual property treaties exist in tension with local needs for flexibility. Using a novel data collection and visualization method, this paper tracks the adoption of IP treaties on the continent of Africa over a 130-year period from 1885-2015. Our analysis highlights empirical data at four distinct points in time coinciding with events in African and international IP law (1935, 1965, 1995, and 2015). We explore relevant historical and legal aspects of each period to assess the evolution of the IP treaty landscape in context. Our findings show that treaties now saturate the IP policy space throughout the continent, limiting the ability to locally tailor approaches to knowledge governance.

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Keywords

international law, intellectual property, development, data visualization, WIPO, WTO, trade, harmonization

Introduction

Innovation policy is important for economic growth and human development.¹ Countries across Africa are, therefore, developing policy to encourage innovation.² Measures that address intellectual property (IP) in a locally relevant way are integral to the broader innovation landscape.

IP policy is complex and controversial because it seeks to balance protection of, and access to, knowledge. Policy that leads to either an absence or overabundance of proprietary IP rights may discourage innovation.³ Domestic policymakers may look to research showing that strict IP protection economically advantages developed countries while disadvantaging developing countries.⁴ Similarly, they may be presented with research supporting a contrary view.⁵ Evidence-based IP policy-making is, therefore, not always easy.⁶

The international dimensions of IP are as complex, or more complex, than the domestic aspects. Because IP protects valuable intangibles, these resources move easily across borders. To address that issue, international treaties set out minimum standards for IP protections. There is tension, however, between harmonization (in the belief that it promotes predictability and, thus, foreign direct investment and international trade) versus flexibility (to eliminate trade barriers, and to ensure local governments are able to develop policies that respond to local needs).

National governments on the continent of Africa are increasingly constrained by international IP law when locally tailoring approaches to knowledge governance. It is also important to note that there have been significant continental and regional

¹ Mammo Muchie, "Towards a Unified Theory of Pan-African Innovation Systems and Integrated Development", Olugbenga Adesida, Geci Karuri-Sebina & Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group Publishing, 2016) at 26.

² Olugbenga Adesida, Geci Karuri-Sebina and Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group Publishing, 2016).

³ Michael A Heller & Rebecca S Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research" (1998) 280:5364 *Science* 698, online: <<http://science.sciencemag.org/content/280/5364/698.full>>; Lawrence Lessig, *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity* (New York: Penguin Press, 2004) online: <<http://www.free-culture.cc/freeculture.pdf>>.

⁴ See for example Clemente Forero-Pineda, "The Impact of Stronger Intellectual Property Rights on Science and Technology in Developing Countries" (2006) 35 *Research Policy* 808; Patricia Higinio Schneider, "International Trade, Economic Growth and Intellectual Property Rights: A Panel Data Study of Developed and Developing Countries" (2005) 78 *J Development Economics* 529.

⁵ See for example James Thuo Gathii, "Strength in Intellectual Property Protection and Foreign Direct Investment Flows in Least Developed Countries" (2015) Loyola University Chicago School of Law Research Paper No. 2015-011 online: <<https://ssrn.com/abstract=2611369>>.

⁶ See Jeremy de Beer, "Evidence-based Intellectual Property Policymaking: A Review of Methods and Conclusions" (2016) 19:5-6 *Journal of World Intellectual Property* 150.

developments in Africa with regard to IP norm-setting.⁷ The confluence of IP policy with trade policy has added another layer of complexity to a wide array of international negotiations.⁸ We are beginning to see empirical evidence of the impact of “IP socialization”, which explains why ostensibly context-inappropriate IP norms are adopted so frequently in developing countries.⁹ Research is also emerging that suggests appropriate strategic directions for African policymakers pursuing deeper continent-wide economic integration.¹⁰ The ability to implement that advice depends, however, partly on the constraints of the entire scheme of global governance of IP matters.

This paper maps the 130-year history of the global international IP treaty landscape governing the protection of, and access to, knowledge in Africa. Our approach looks to the past and present in order to build a rich context for policymakers looking to the future. This approach offers a preliminary overview of the opportunities for IP policy innovation in each country, and the continent as a whole.

We begin by describing our novel data collection and visualization method, used to help understand the history and extent to which African countries are bound to the global IP regime. Our analysis corresponds to four distinct periods in treaty-making history. Beginning with 1885 to 1935, we describe how IP treaties were instruments of colonialist policy. Up to 1965, we observe how treaties were maintained in a neo-colonial response to independence. The period up to 1995 was characterized by attempts to limit the influence of African countries on global IP policy. Finally, we examine the “African rising” phenomena from 1996 to 2015 in the context of a new focus on innovation policy.

⁷ Caroline B Ncube, *Intellectual Property Policy, Law and Administration in Africa: Exploring Continental and Sub-regional Co-operation* (London, UK: Routledge 2016).

⁸ Jeremy de Beer, “Applying Best Practice Principles to International Intellectual Property Lawmaking” (2013) 44:8 IIC - International Review of Intellectual Property and Competition Law 884.

⁹ Jean-Frederic Morin, Kevin Daley, and E Richard Gold, “Having Faith in IP: Empirical Evidence of IP Conversions” (2011) 3:1 The WIPO Journal 93.

¹⁰ Caroline B Ncube et al, “Assessing Regional Integration in Africa VIII: Background Paper on Intellectual Property Rights and Innovation” Open AIR Working Paper 5 (5 May 2017).

Methods

The methods in this study involved four overlapping activities: 1) identifying international IP treaties, 2) gathering, processing and validating data, 3) developing the interactive map web application, and 4) performing quantitative and qualitative analysis.

1. Identifying International IP Treaties

We began by identifying relevant international treaties and agreements to include in the study. A review of WIPO's website and other resources¹¹ provided a list of 34 instruments that met the following criteria for inclusion:

- the instrument is multilateral;
- the list of parties to the instrument includes at least one African country; and
- the instrument binds signatories to take measures in respect of:
 - copyrights,
 - patents,
 - trademarks,
 - trade secrets,
 - traditional knowledge,
 - bio-diversity, or
 - genetic resources.

We did not include in our study multilateral trade agreements or economic partnerships, other than the WTO Agreement on Trade-Related Aspects of Intellectual Property, TRIPS.¹² While such other agreements and partnerships are highly relevant to the international IP landscape governing knowledge in Africa, mapping their proliferation and analyzing their implications would require different methods and data sources. That work remains to be done.

WIPO administers 26 treaties, all of which met the criteria for inclusion in the study, listed among the items in Table 1.¹³ The organization curates records of four additional treaties: TRIPS, the *International Treaty on Plant Genetic Resources*, and the *Universal*

¹¹ Susy Frankel & Daniel J. Gervais, *Advanced Introduction to International Intellectual Property* (Glos, UK: Edward Elgar Publishing, 2016); United Nations Economic Commission for Africa, *Innovation, Competitiveness, and Regional Integration: Assessing Regional Integration in Africa VII* (Addis Ababa, Ethiopia: Economic Commission for Africa, 2016); World Intellectual Property Organization, "WIPO-Administered Treaties" *WIPO* (website), online: <<http://www.wipo.int/treaties/en/>>.

¹² The TRIPS Agreement is Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization.

¹³ *Ibid*, "WIPO-Administered Treaties".

Copyright Convention (UCC), which are also included in Table 1.¹⁴ We accessed information pertaining to the other agreements in Table 1, the *Nagoya Protocol*, the *International Treaty on Plant Genetic Resources for Food and Agriculture*, and the *International Union for the Protection of New Varieties of Plants* (UPOV) on their respective websites.¹⁵ Only publicly available records, published online, were used in this study.

¹⁴ The *Beijing Treaty on Audiovisual Performances*, and the *Washington Treaty on Intellectual Property in Respect of Integrated Circuits* are not yet in force, and therefore excluded from our analysis.

¹⁵ Convention on Biological Diversity, “Parties to the Nagoya Protocol” accessed: 4 Sept 2016, online: <www.cbd.int/abs/nagoya-protocol/signatories/default.shtml>; International Union for the Protection of New Varieties of Plants, “UPOV Lex: Convention Notifications” accessed: 4 Sept 2016, online: <www.upov.int/upovlex/en/notifications.jsp>; The International Treaty on Plant Genetic Resources for Food and Agriculture, “Contracting Parties to the Treaty” accessed: 4 Sept 2016, online: <www.planttreaty.org/list_of_countries>.

Table 1: Intellectual Property Treaties and Ratification Rates, 1935 – 2015 (listed alphabetically)

Treaty	Regime	Source	Countries Ratified			
			1935	1965	1995	2015
Beijing Treaty On Audiovisual Performances (2012)	Copyrights	WIPO				1
Berne Convention For The Protection For Literary And Artistic Works (1886)	Copyrights	WIPO	3	13	35	44
Brussels Convention Re: Distribution Of Programme-Carrying Signals Transmitted By Satellite (1974)	Neighbouring Rights	WIPO			2	4
Budapest Treaty On The Intl Recognition Of The Deposit Of Microorganisms For The Purposes Of Patent Procedure (1977)	Patents	WIPO				3
Intl Treaty On Plant Genetic Resources For Food And Agriculture (2001)	Plant Genetic Resources	WIPO				42
Hague Agreement Concerning The Intl Registration Of Industrial Designs (1925)	Industrial Designs	WIPO	2	3	6	15
Lisbon Agreement For The Protection Of Appellations Of Origin And Their International Registration (1958)	Geographic Indications	WIPO			6	6
Locarno Agreement Establishing An Intl Classification For Industrial Designs (1968)	Industrial Designs	WIPO			1	2
Madrid Agreement For The Repression Of False Or Deceptive Indications Of Sources Of Goods (1891)	Trademarks	WIPO	2	3	4	4
Madrid Agreement Concerning Intl Registration Of Marks (1891)	Trademarks	WIPO	1	2	5	11
Protocol Relating To The Madrid Agreement Concerning The Intl Registration Of Marks (1989)	Trademarks	WIPO				21
Marrakesh VIP Treaty (2013)	Copyrights	WIPO				1
Nagoya Protocol (2010)	Access and Benefit Sharing	CBD Secretariat				30
Nairobi Treaty On The Protection Of The Olympic Symbol (1981)	Trademarks	WIPO			11	11
Nice Agreement Concerning The Intl Classification Of Goods And Services For The Purposes Of The Registration Of Marks (1957)	Trademarks	WIPO			5	9
Paris Convention For The Protection Of Industrial Property (1883)	Patents and Trademarks	WIPO	2	22	39	49

Treaty (cont.)	Regime (cont.)	Source (cont.)	Countries Ratified (cont.)			
			1935	1965	1995	2015
Patent Cooperation Treaty (1970)	Patents	WIPO			22	45
Convention For The Protection Of Producers Of Phonograms Against Unauthorized Duplication Of Their Phonograms (1971)	Neighbouring Rights	WIPO			4	6
Patent Law Treaty (2000)	Patents	WIPO				1
Rome Convention For The Protection Of Performers, Producers Of Phonographs, And Broadcasting Organizations (1961)	Copyrights	WIPO		2	5	9
Singapore Treaty On The Law Of Trademarks (2000)	Trademarks	WIPO				3
Strasbourg Agreement Concerning The Intl Patent Classification (1971)	Patents	WIPO			2	3
Trademark Law Treaty (1994)	Trademarks	WIPO				4
TRIPS Agreement (1995)	Comprehensive	WIPO			33	43
Universal Copyright Convention (1952)	Copyrights	WIPO		4	14	15
Universal Copyright Convention (1971)	Copyrights	WIPO			9	10
Intl Convention For The Protection Of New Varieties Of Plants (1961)	Plant Varieties	UPOV			1	1
Intl Convention For The Protection Of New Varieties Of Plants (1978)	Plant Varieties	UPOV			1	2
Intl Convention For The Protection Of New Varieties Of Plants (1991)	Plant Varieties	UPOV				3
Vienna Agreement Establishing An Intl Classification Of The Figurative Elements Of Marks (1973)	Trademarks	WIPO			1	2
Washington Treaty On Intellectual Property In Respect Of Integrated Circuit (1989)	Computer Chips	WIPO			1	1
WIPO Copyright Treaty (1996)	Copyrights	WIPO				12

Treaty (cont.)	Regime (cont.)	Source (cont.)	Countries Ratified (cont.)			
			1935	1965	1995	2015
UN Convention On WIPO (1967)	Copyrights	WIPO			43	53
WIPO Performances And Phonograms Treaty (1996)	Neighbouring Rights	WIPO				12

2. Gathering, Processing and Validating Data

Treaties administered by WIPO include a “Contracting Parties” section containing a table listing parties to the treaty, signature date, ratification date and legal instrument used, date in force, and other details. Similar tables were available for the *Nagoya Protocol*, administered by the Secretariat of the Convention on Biological Diversity (CDB), and the *International Treaty on Plant Genetic Resources*, administered through the Food and Agriculture Organization (FAO).

From these online tables, we scraped the raw data for each treaty and their accompanying acts into an Excel database. All data was collected in June 2016. Data from each treaty and act was deposited in a separate sheet in the database. Because tables were not available online for the three UPOV treaties (1961, 1978, 1991), we constructed the data manually from the list of convention notifications.

We then cleaned and processed the data. After ensuring all entries were represented in machine-readable formats, we began by identifying and isolating the entries for African countries and then compiled the data into a series of aggregated tables for use in the study. Because WIPO reports the treaty status of current states, only those states listed by WIPO or other administering organizations were included in the study.

A polished, user-friendly version of the database was uploaded to [Airtable.com](https://airtable.com),¹⁶ a cloud database provider, so the database can be used as an open source resource by researchers and the general public.

3. Developing the Interactive Map

To visualize the adoption of international treaties across time and space we developed an interactive map web application.¹⁷ The application superimposes a vector circle over each African country representing the number of treaties ratified by that country. The larger the circle, the greater the number of ratified treaties. A slider changes the display in five-year increments ranging from 1885 to 2015, allowing users to view the history of IP treaty ratification across a 130-year period.

We used JavaScript, the Leaflet.js data-mapping library, and Mapbox to develop the web application.¹⁸ We sourced latitudinal and longitudinal data from Google’s Open

¹⁶ Jeremy de Beer, Jeremiah Baarbé and Caroline B Ncube, “Status of IP Treaties in Africa Database” (2016) [Airtable.com](https://airtable.com/shrzv2z90oLqPPA6Q), online: <<https://airtable.com/shrzv2z90oLqPPA6Q>>.

¹⁷ Jeremiah Baarbé, “Interactive Map Showing the Status of IP Treaties in Africa, 1885-2015” (2016) online: <lawbrowser.ca>; baarbeh, “Status of Treaties Interactive Map” (Source Code Repository) [Github.com](https://github.com/baarbeh/SoT-InteractiveMap), online: <<https://github.com/baarbeh/SoT-InteractiveMap>>.

¹⁸ Leaflet, “An Open-Source JavaScript Library for Mobile Friendly Interactive Maps” online: <leafletjs.com>; Mapbox, “Mapbox Studio” online: <www.mapbox.com/mapbox-studio>.

Dataset Canonical Concepts repository.¹⁹ The application was based on Donohue, Sack and Roth's time series mapping tutorial.²⁰

4. Performing the Analyses

Several quantitative and qualitative analyses are made possible by the unique data collection and visualization methods used in this study. Descriptive statistics show the status of treaty ratification across the continent, identifying which countries offer more or less opportunities for IP policy innovation. We used Excel to calculate common statistical descriptors.

Anticipating that readers of this study may not be familiar with statistical analyses, Table 2 summarizes and defines some of the statistical tools, methods, and concepts used in this study.

Qualitatively, the interactive map reveals the 130-year history of IP treaty adoption in Africa. It contrasts the colonial and neo-colonial legacy of the international IP system with attempts to encourage development through knowledge governance. This project also lays the groundwork for future analyses using inferential statistics to investigate longitudinal relationships between treaty adoption and various metrics, including the Human Development Index, Global Innovation Index, and Gross Domestic Product.

Table 2: Statistical Tools and Concepts Used in the Study

Tool	Description
Mean (Average)	The mean measures the central tendency of a dataset by dividing the sum of that dataset by its count. Accordingly, the mean takes into account each value of that dataset. The mean, however, is sensitive to outliers.
Median (Midpoint)	The median measures the central tendency of a dataset by providing the middle value of that dataset. Accordingly, the mean is not affected by extreme values. However, the median accounts for the precise value of only one data point.
Standard Deviation	The standard deviation measures the dispersion or spread of a dataset around its mean. The more variable a dataset is, the greater the standard deviation.

¹⁹ Google, "Countries.csv" Open Dataset Canonical Concepts, online: <developers.google.com/public-data/docs/canonical/countries_csv>.

²⁰ Richard G Donohue, Carl M. Sack, Robert E. Roth, "Time Series Proportional Symbol Maps with Leaflet and jQuery" (2013) online: <www.cartographicperspectives.org/index.php/journal/article/view/cp76-donohue-et-al/1307>.

Analysis and Discussion

1. The Database

Table 3 presents major highlights of information in our database. Beginning in 1884, when Tunisia ratified the *Paris Agreement*, the database tracks the dates on which 54 African countries ratified 34 international IP treaties across a 133-year time span. During this time, ratifications increased to a total of 485 treaties ratified during or before 2015.

Table 3: Characteristics of the Dataset

	Figure
Number of countries included in the database	54
Number of intellectual property treaties included in the database	34
Number of sub-acts included in the database (not presently considered)	40
Number of unique data-points representing the date a treaty is ratified	485
Number of unique data-points including signature and in force dates	1349

Ratification dates were chosen because they represent the date on which legal obligations took or take effect in that country. Because countries did not ratify the TRIPS agreement, the in-force date was used as a measure of legal obligation on a country. In addition to ratification dates, the full database includes an additional 1,349 signatures and in-force dates for the 34 treaties, and an additional 40 sub-acts that were not considered in this study.

Our analysis of the data corresponds with three distinct points (1965, 1995, and 2015) when treaty adoption notably increased. Unsurprisingly, these periods align with significant events in African history and international IP law, described below. We chose to begin the analysis in 1935, as it is representative of the treaty landscape in colonial Africa and because of its significance as the year in which Italy invaded Ethiopia. Based on these points in time, we compiled and assessed historical information on four distinct periods: 1885 to 1935, 1936 to 1965, 1966 to 1995, and 1996 to 2015.

Table 4 presents the cumulative number of treaties ratified by each country, on or before 1935 and 1965. Table 5 presents the same information for 1995 and 2015. Both tables display the relative adoption of treaties as a percentage of all IP treaties in force and available to be ratified at that time. The following information is provided for each year: the minimum and maximum number of treaties signed by any one country, and the median, average and standard deviation for the number of treaties signed.

Table 4: Ratification Status of African Countries, 1935 and 1965

Country	1935		1965		Country (cont.)	1935		1965	
	Treaties Ratified	% Treaties in Force (5)	Treaties Ratified	% Treaties in Force (11)		Treaties Ratified	% Treaties in Force (5)	Treaties Ratified	% Treaties in Force (11)
Algeria			1	9.1%	Mali			1	9.1%
Angola					Mauritania			1	9.1%
Benin			1	9.1%	Mauritius				
Botswana					Morocco	5	100%	5	45.5%
Burkina Faso			2	18.2%	Mozambique				
Burundi					Namibia				
Cameroon			2	18.2%	Niger			3	27.3%
Cabo Verde					Nigeria			2	18.2%
Comoros					Rwanda				
Central African Republic			1	9.1%	Sao Tome and Principe				
Chad			1	9.1%	Senegal			2	18.2%
Congo			3	27.3%	Seychelles				
Democratic Republic of the Congo			1	9.1%	Sierra Leone				
Djibouti					Somalia				
Egypt			4	36.4%	South Africa	1	20%	2	18.2%
Equatorial Guinea					South Sudan				
Eritrea					Sudan				
Ethiopia					Swaziland				
Gabon			2	18.2%	United Republic of Tanzania			1	9.1%
The Gambia					Togo				
Ghana			1	9.1%	Tunisia	4	80%	4	36.4%
Guinea-Bissau					Uganda			1	9.1%
Guinea					Zambia			1	9.1%
Côte d'Ivoire			2	18.2%	Zimbabwe				
Kenya			1	9.1%					
Lesotho					Min	1		1	

Liberia			1	9.1%	Max	5		5	
Libya					Median	4		1	
Madagascar			1	9.1%	Mean (Standard Deviation)	3.3 (1.7)		1.8 (1.1)	
Malawi			2	18.2%	Total Signatory Countries	3 countries		27 countries	

Table 5: Ratification Status of African Countries, 1995 and 2015

Country	1995		2015		Country (cont.)	1995		2015	
	Treaties Ratified	% Treaties in Force (26)	Treaties Ratified	% Treaties in Force (34)		Treaties Ratified	% Treaties in Force (26)	Treaties Ratified	% Treaties in Force (34)
Algeria	9	34.6%	16	47.1%	Mali	5	19.2%	11	32.4%
Angola	1	3.8%	5	14.7%	Mauritania	5	19.2%	7	20.6%
Benin	6	23.1%	12	35.3%	Mauritius	5	19.2%	7	20.6%
Botswana	1	3.8%	11	32.4%	Morocco	12	46.2%	20	58.8%
Burkina Faso	8	30.8%	13	38.2%	Mozambique	1	3.8%	9	26.5%
Burundi	3	11.5%	5	14.7%	Namibia	3	11.5%	10	29.4%
Cameroon	7	26.9%	8	23.5%	Niger	7	26.9%	11	32.4%
Cabo Verde			4	11.8%	Nigeria	6	23.1%	8	23.5%
Comoros			5	14.7%	Rwanda	5	19.2%	12	35.3%
Central African Republic	5	19.2%	5	14.7%	Sao Tome and Principe			5	14.7%
Chad	4	15.4%	6	17.6%	Senegal	9	34.6%	12	35.3%
Congo	7	26.9%	10	29.4%	Seychelles			6	17.6%
Democratic Republic of the Congo	4	15.4%	7	20.6%	Sierra Leone	2	7.7%	7	20.6%
Djibouti	1	3.8%	6	17.6%	Somalia	1	3.8%	1	2.9%
Egypt	11	42.3%	17	50%	South Africa	6	23.1%	9	26.5%
Equatorial Guinea	1	3.8%	5	14.7%	South Sudan				
Eritrea			2	5.9%	Sudan	4	15.4%	8	23.5%
Ethiopia	1	3.8%	4	11.8%	Swaziland	4	15.4%	8	23.5%
Gabon	6	23.1%	11	32.4%	United Republic of	4	15.4%	8	23.5%

					Tanzania				
The Gambia	3	11.5%	7	20.6%	Togo	7	26.9%	15	44.1%
Ghana	5	19.2%	11	32.4%	Tunisia	12	46.2%	17	50%
Guinea-Bissau	4	15.4%	7	20.6%	Uganda	5	19.2%	7	20.6%
Guinea	7	26.9%	16	47.1%	Zambia	4	15.4%	7	20.6%
Côte d'Ivoire	6	23.1%	8	23.5%	Zimbabwe	4	15.4%	7	20.6%
Kenya	10	38.5%	15	44.1%					
Lesotho	6	23.1%	10	29.4%	Min	1		1	
Liberia	6	23.1%	11	32.4%	Max	12		20	
Libya	3	11.5%	5	14.7%	Median	5		8	
Madagascar	5	19.2%	10	29.4%	Mean (Standard Deviation)	5.2 (2.8)		9.0 (4.0)	
Malawi	9	34.6%	11	32.4%	Total Signatory Countries	48 countries		53 countries	

2. 1885 – 1935, Intellectual Property as Colonialist Policy

In October 1935, Mussolini invaded Ethiopia and the last independent African state fell under foreign occupation, marking the end of the “Scramble for Africa” and the “golden age of colonialism.”²¹ Economies across Africa were struggling to emerge from global recession. Italy’s invasion of Ethiopia challenged international diplomacy, as the League of Nations was powerless to prevent aggression between two of its member states.

Fifty years earlier, at the beginning of the “Scramble”, the colonial powers of Britain, Belgium, France, Germany, Italy and Spain formed an international (yet decidedly Eurocentric) intellectual property union. The *Paris Convention* (1883) protected industrial property, including patents; the *Berne Convention* (1886) protected the copyright of authors and publishers; and the *Madrid Agreements* (1891) protected trademarks and the counterfeiting of goods. Later, the *Hague Agreement* (1925) protected industrial designs. These treaties were designed to extend the national IP policies of the colonial powers to as many markets as possible.

European powers agreed to carve up the continent of Africa at the Berlin West Africa Conference (1884-85) with the goal of controlling African markets.²² IP treaties were used to control creative and industrial markets in the interest of European rights-holders.²³ For example, colonial authors in the British Empire, prior to 1886, had to first publish their works in the United Kingdom in order to acquire copyright.²⁴ Other colonial powers were more explicit in their discrimination. For example, German legislation expressly prevented “*Eingeborne*” (“natives”) from holding rights to IP.²⁵

The data conceals the colonial history of IP treaties in Africa, although some accounts of this history has been given elsewhere.²⁶ According to WIPO, by 1935 only three countries (Morocco, South Africa, and Tunisia) had ratified international IP treaties. Morocco had ratified all of the five treaties in force at the time. South Africa had ratified one treaty. Tunisia had ratified four treaties, of which it was a negotiating party to three: the *Berne Convention*, the *Hague Agreement* and the *Madrid Agreement (Indications of Source)*. As independent protectorates and colonies, these early

²¹ Kevin Shillington, *History of Africa* (New York: St. Martin’s Press, 1989) at 301; Ali A Mazrui & C Wondji eds *General History of Africa Volume VIII: Africa since 1935* (Paris: UNESCO, 1993) at 58.

²² *Ibid*, Shillington at 301–05.

²³ Alexander Peukert, “The Colonial Legacy of the International Copyright System” in Ute Röchenthaler & Mamadou Diawara, eds, *Copyright Africa: How Intellectual Property, Media and Markets Transform Immaterial Goods* (Canon Pyon, UK: Sean Kingston Publishing, 2016) 37 at 40.

²⁴ *Ibid* at 41–43.

²⁵ *Ibid* at 41.

²⁶ Caroline B Ncube, “Three Centuries and Counting: The Emergence and Development of Intellectual Property Law in Africa” in Rochelle C Dreyfuss & Justine Pila, eds, *The Oxford Handbook of Intellectual Property Law* (Oxford, UK: Oxford University Press, Forthcoming) online: <<https://ssrn.com/abstract=2828680>>; T Kongolo, “Historical Evolution of Copyright Legislation in Africa” (2014) 5:2 WIPO J 163 at 168–70; T Kongolo, “Historical Developments of Industrial Property Laws in Africa” (2013) 5:1. WIPO J 105 at 115–16; Ruth L Okediji, “The International Relations of Intellectual Property: Narratives of Developing Country Participation in the Global Intellectual Property System” (2003) 7 Singapore J Intl & Comparative L 315 at 323.

ratifications were effected through their colonial powers. For example, a French law professor represented Tunisia in Berne, while French diplomats represented Tunisia in Madrid and The Hague.²⁷

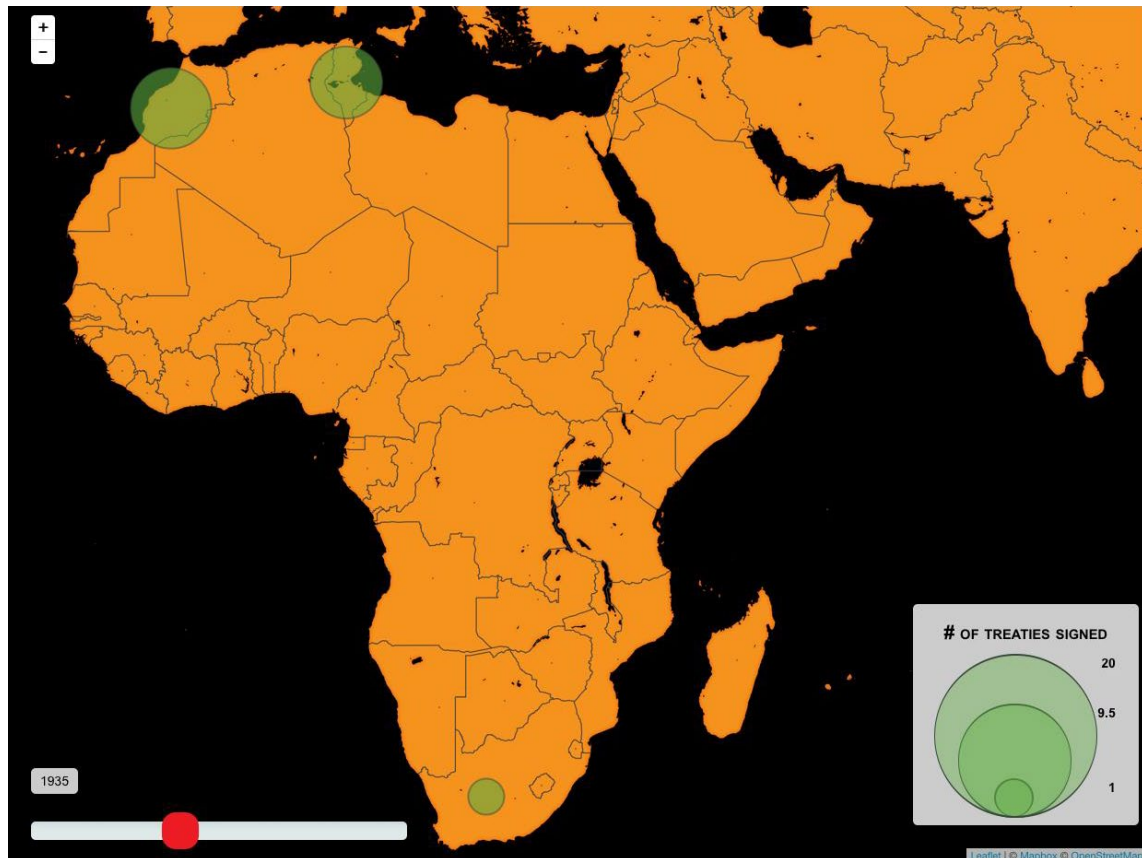


Figure 1: African treaty landscape in 1935.

Not visible in the data are the African colonies that all major colonial powers brought into the International IP regime. Article 19 of the *Berne Convention (1886)* expressly gives “Countries acceding to the present Convention ... the right to accede thereto at any time for their Colonies.”²⁸ A similar provision was added to the *Paris Convention*, the *Hague Agreement* and the *Madrid Agreements* during the London Revision Conference in 1934.²⁹ All colonial powers used these provisions during this period to

²⁷ *Ibid* at 44; *Arrangement De La Have Concernant Le Dépôt International Des Dessins ou Modèles Industriels* (Hague Agreement) 6 November 1925, WIPO Lex at 631, online: <www.wipo.int/wipolex/en/treaties/text.jsp?file_id=280732>; *Arrangement De Madrid Concernant La Répression Des Fausses Indications De Provenance Sur Les Marchandises* (Madrid Agreement, Indications of Source) 14 April 1891, WIPO Lex at 191, online: <www.wipo.int/wipolex/en/treaties/text.jsp?file_id=281783>.

²⁸ *Convention de Berne pour la Protection des Œuvres Littéraires et Artistiques* (Berne Convention) 9 September 1886, WIPO Lex at art 19, translated online: <http://keionline.org/sites/default/files/1886_Berne_Convention.pdf>.

²⁹ GHC Bodenhusen, *Guide to the Application of the Paris Convention for the Protection of Industrial Property as Revised at Stockholm in 1967*, (Berne: BIRPI, 1969) at 18, online: <books.google.ca/books?id=EDfulOT5rxQC>.

unilaterally declare that treaty obligations extended to their colonies. However, these declarations are not visible in the data or readily available on any website we located.³⁰

3. 1936 – 1965, Neo-colonial Response to Independence

In September 1940, Italian forces invaded Egypt, escalating confrontation on the African front of the Second World War. Throughout the war, French and British colonies provided troops and resources that were essential to the Allied war effort. After the war, rising African nationalism and Europe's reduced capacity to maintain control over the colonies led to a movement for independence across the continent.³¹ By the early 1960s, most African countries achieved independence.³²

During this period of decolonization, the United International Bureaux for the Protection of Intellectual Property (BIRPI), the precursor to WIPO, worried that newly independent African countries would abandon the international IP regime. By this time, it was widely recognized that developing countries benefited from relaxed IP protections. Additionally, the international IP regime maintains a western paradigm of creativity and ownership that did not reflect African realities. Finally, it was questionable whether the legal obligations made by former colonial powers had any positive effect on these newly formed countries.³³

In March 1960 BIRPI sent a letter to these countries suggesting that they formally declare continued adherence to the international IP regime for the sake of "legal security."³⁴ A number of transnational organizations around this time held seminars in Africa, promoting robust IP protections as essential for economic prosperity.³⁵ As a result, most newly independent countries declared membership in the international IP regime shortly after gaining independence.

³⁰ For example, WIPO notes under "Details" that France's ratification of *Berne* included colonies but does not specify which colonies, or when the treaty obligations took effect, WIPO-Administered Treaties, "Contracting Parties > Berne Convention (Total Contracting Parties: 172)" WIPO, online: <www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=15>.

³¹ Shillington, *supra* note 21 at 374.

³² *Ibid* at 373–406.

³³ International law recognizes that newly independent states are not bound to become parties to any treaty in force at the date of Succession, *Vienna Convention on Succession of States in Respect of Treaties* 6 November 1978, 1978 UNTS 3 at art 16.

³⁴ Peukert, *supra* note 23 at 51.

³⁵ *Ibid* at 52–53.

Commentators point out that these attempts to stabilize international IP law were a form of neo-colonialism.³⁶ Treaty membership imposed the same legal obligations as colonial control, guaranteeing foreign ownership rights. At the same time, newly formed countries were prevented from developing IP policy to address local needs, including providing access to knowledge for education or protecting indigenous knowledge. Others were persuaded or pressured into adopting minimum standards which were not appropriate or even required of them, as they were least-developed countries.³⁷ While tangible property rights were the primary legal mechanism used to maintain foreign control during colonialism, IP rights maintained control and economic penetration through independence.³⁸

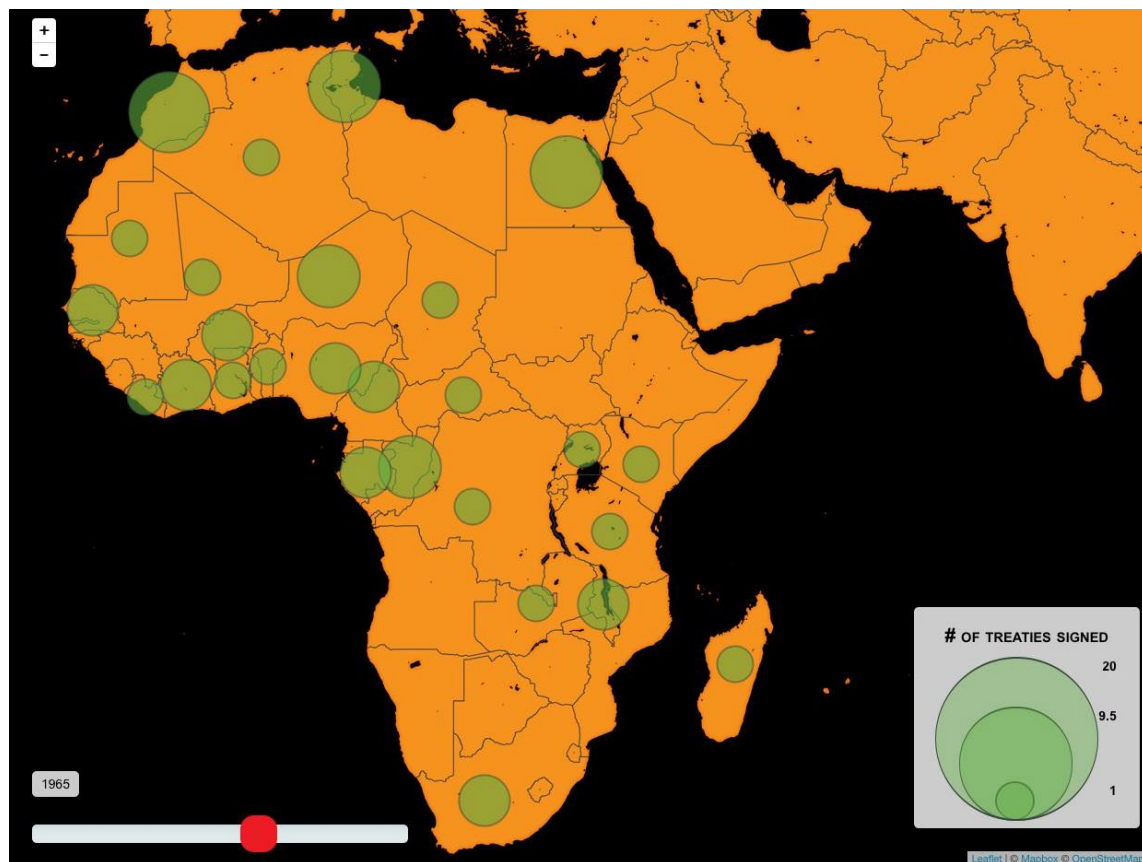


Figure 2: African Treaty Landscape in 1965

³⁶ *Ibid* at 51; Andreas Rahmatian, “Neo-Colonial Aspects of Global Intellectual Property Protection” (2009) 12:1 J World Intell Prop 40 online: <www.farzadalvi.com/wp-content/uploads/2012/01/Rahmatian-2009.pdf>; Alan H Lazar, “Developing Countries and Authors’ Rights in International Copyright” (1969) 19 Copyright L Symp 1 online:

<heinonline.org/HOL/LandingPage?handle=hein.journals/cpyrgt19&div=7&id=&page=>.

³⁷ Carolyn Deere, “The Politics of Intellectual Property Reform in Developing Countries: The Relevance of the World Intellectual Property Organization” in N Weinstock Netanel, ed, *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford, UK: Oxford University Press, 2008) 111; Carolyn Deere, *The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (Oxford, UK: Oxford University Press, 2008) 241–42.

³⁸ Rahmatian, *supra* note 36 at 42.

By 1965, close to half of the continent had ratified or declared membership in the *Paris Convention* (1883) and the *Berne Convention* (1886). 27 countries had ratified one or more treaties (typically *Paris* and/or *Berne*). On average, these 27 countries had ratified 1.8 treaties, with a median of one treaty. The number of African members in *Paris* grew to 22 countries, while membership in *Berne* grew to 13 countries.

The number of multilateral IP treaties also grew during this period to include the *Rome Convention for the Protection of Performers, Producers of Phonographs, and Broadcasting Organizations* (1961), ratified by Congo and Niger. The United States' more permissive response to *Berne*, the *Universal Copyright Convention* (1952) also gained traction among Ghana, Liberia, Malawi, and Nigeria.

4. 1966 – 1995, Limiting African Influence: Stockholm, WIPO and TRIPS

In the summer of 1967, BIRPI member nations met in Stockholm for one of the last rounds of revisions to *Paris* and *Berne*. Developing countries began to express their concerns during the negotiations, having finally received a voice at the table. As a result, a more relaxed “Protocol Regarding Developing Countries” was negotiated into *Berne*, which included a shorter copyright term and compulsory licensing.³⁹ Of the 13 African signatories to *Berne* at the time, 11 countries declared their intention to follow the protocol.⁴⁰

Many European countries did not approve of the Protocol and at the next revision conference in Paris (1971), major revisions were made to create a global IP regime and close loopholes used by developing countries.⁴¹ These revisions aligned the more permissive *UCC* with *Berne* and implemented a more complicated and restrictive developing country protocol. However, few countries implemented this revised protocol. Some scholars have shown the limited utility of this protocol due to its complexity and unworkable provisions.⁴²

The Stockholm conference brought another significant change to the international IP treaty landscape in the form of the World Intellectual Property Organization (WIPO). WIPO took over from BIRPI in 1970 as the custodian of the *Berne* and *Paris* conventions and related IP treaties.⁴³ In 1974, WIPO became part of the United Nations.

By 1995, the WIPO Convention achieved the highest African adoption of any treaty at the time, with 43 member countries. The *Paris Convention* had the second-highest

³⁹ Protocol Regarding Developing Countries, *Berne Convention for Protection of Artistic and Literary Works, as revised at Stockholm*, 14 July 1967 WIPO Lex, online: <www.wipo.int/wipolex/en/details.jsp?id=12801>.

⁴⁰ WIPO-Administered Treaties, “Contracting Parties > Berne Convention > Stockholm Act (1967)” WIPO, online: <www.wipo.int/treaties/en/ActResults.jsp?act_id=23>.

⁴¹ Peukert, *supra* note 23 at 54.

⁴² Susan Isiko Strba, *International Copyright Law and Access to Education in Developing Countries: Exploring Multilateral Legal and Quasi-Legal Solutions* (Martinus: Nijhoff Publishers, 2012).

⁴³ Frankel and Gervais, *supra* note 11 at 6.

adoption rate, with 39 ratifying countries, while the *Berne Convention* had 35 adopting countries.

The period before TRIPS saw the number of IP treaties increase. African countries ratified 13 new treaties in this period, for a total of 26 treaties in force at the time. Most of these new treaties addressed details of the industrial property and copyright regimes that were not specified in *Paris* or *Berne*. Other treaties broke ground on new areas of IP, including plant breeder's rights in *UPOV* (1961, 1971), and the *Nairobi Treaty on the Protection of the Olympic Symbol* (1981).

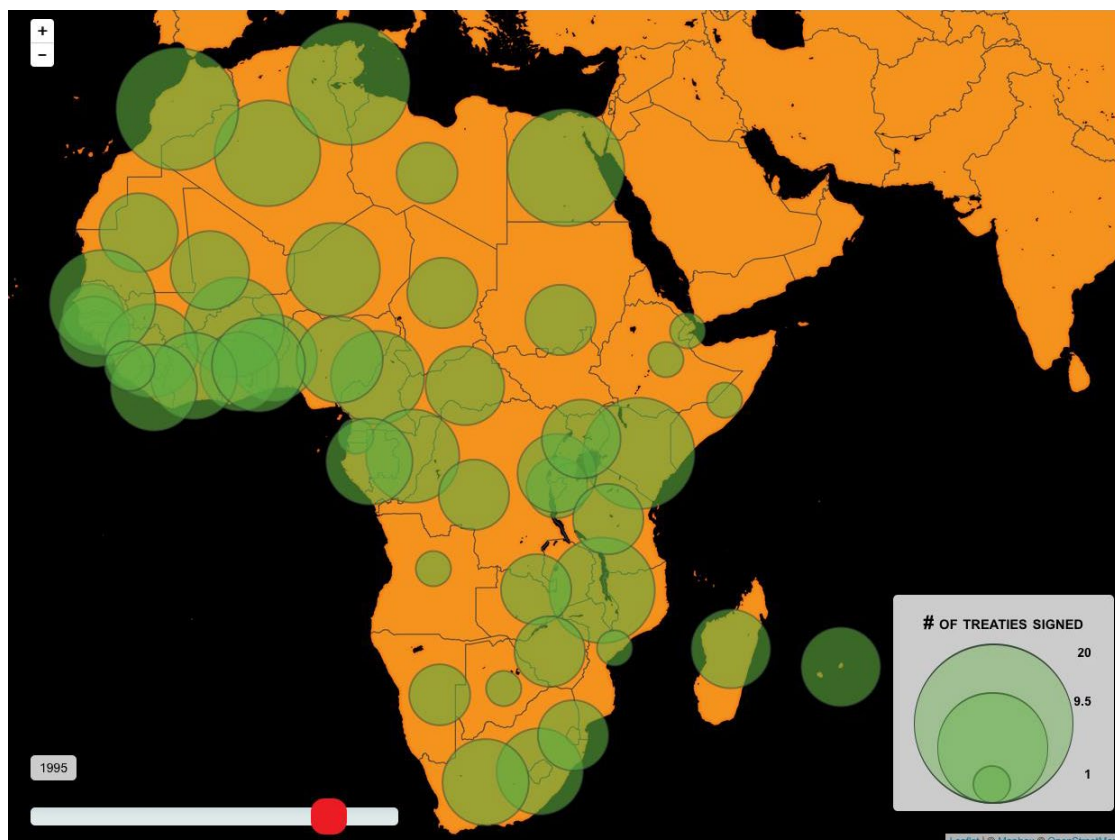


Figure 3: African Treaty Landscape in 1995

It is important to note that African countries had limited involvement with the initial negotiations for these 13 new treaties. Just over seven African countries participated in forming each of these treaties, on average. But, of these participating countries, few chose to be signatories. Fewer than three countries, on average, signed the treaties on ratification. African countries were most represented at the diplomatic conferences for the *Nairobi Treaty* (18 participants, eight signatories),⁴⁴ the *Washington Treaty* (16

⁴⁴ World Intellectual Property Organization, *Records of the Nairobi Diplomatic Conference for the Adoption of a Treaty on the Protection of the Olympic Symbol* (Geneva: WIPO, 1981) at 121–40.

participants, four signatories),⁴⁵ and the *Patent Cooperation Treaty* (15 participants, six signatories).⁴⁶ African countries were least represented at the 1978 and 1991 *UPOV* conferences (one participant, one signatory),⁴⁷ the *Budapest Treaty* (two participants, one signatory),⁴⁸ and the *Madrid Protocol* (three participants, three signatories).⁴⁹ Notably, the *Nairobi Treaty*, is among the least important for African economic and cultural development because it addresses a specific issue, the use of the Olympic symbol. The *Washington Treaty* is not yet in force despite being formed in 1989. So, African countries were most represented in negotiations that mattered least.

Despite these challenges, the international IP regime continued to expand across the continent. By 1995, 48 countries had ratified one or more treaty, with half of these having ratified five or more treaties. On average countries were bound by just over five treaties. The average country varied from the mean (standard deviation) by almost three treaties, indicating relatively large differences in treaty adoption. The five core instruments signed by a majority of countries included: *Paris*, *Berne*, the *Patent Cooperation Treaty*, the *WIPO Convention*, and *TRIPS*.

As the developing world became more vocal, the developed world sought new strategies to limit their influence. WIPO's structure gave developing countries a greater voice, making it harder for Western countries to implement their IP agenda. As a result, developed nations brought IP into the realm of international trade, where their value of trade gave them greater influence, leading to the negotiation of the World Trade Organization (WTO) and the TRIPS Agreement.

Negotiated during the establishment of the WTO, the TRIPS Agreement is the most comprehensive and important IP treaty to date.⁵⁰ It includes and extends the previous IP regime under the *Paris* and *Berne Conventions*. Because the TRIPS agreement was included as Annex 1C in the Marrakesh Agreement that founded the WTO, countries that wished to participate in global trade were required to adopt TRIPS. The Marrakesh Agreement was signed in 1994, and by 1995 it had legal effect in 33 African countries.

⁴⁵ World Intellectual Property Organization, *Records of the Diplomatic Conference for the Conclusion of a Treaty on the Protection of Intellectual Property in Respect of Integrated Circuits* (Geneva: WIPO, 1989) at 371–92.

⁴⁶ World Intellectual Property Organization, *Records of the Washington Diplomatic Conference on the Patent Cooperation Treaty, 1970* (Geneva: WIPO, 1972) at 539–50.

⁴⁷ International Union for the Protection of New Varieties of Plants, *Records of the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants, 1978* (Geneva: UPOV, 1981) at 291–96; International Union for the Protection of New Varieties of Plants, *Records of the Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants, 1991* (Geneva: UPOV, 1992) at 479–96.

⁴⁸ World Intellectual Property Organization, *Records of the Budapest Diplomatic Conference for the Conclusion of a Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure* (Geneva: WIPO, 1977) at 463–75.

⁴⁹ World Intellectual Property Organization, *Records of the Diplomatic Conference for the Conclusion of a Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks, 1989* (Geneva: WIPO, 1991) at 335–51.

⁵⁰ Frankel and Gervais, *supra* note 11 at 29. See also Carolyn Deere, *The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (Oxford: Oxford University Press, 2009).

The TRIPS agreement includes an enforcement mechanism, allowing infringing states to face trade sanctions before a WTO tribunal. The agreement faced a crisis shortly after enactment, as the agreement required developing nations to purchase expensive AIDS treatments from western patent holders. In 1995, UNAIDS estimated that 4,039,000 people in Africa lived with HIV with 181,200 deaths that year alone.⁵¹ The epidemic revealed the limits of treaty flexibility. Millions of Africans died for a lack of retroviral drugs before the Doha Declaration affirmed that TRIPS did not prevent countries from taking measures to protect public health.⁵²

5. 1996 – 2015, Africa Rising

By 1996 the African independence movement was largely complete. Apartheid in South Africa ended in 1994. Newly franchised black voters elected Nelson Mandela and began forming a new constitution. Namibia had gained independence in 1990, Eritrea in 1993. Later in 2011, Sudan divided into two countries: Sudan and South Sudan. The Cold War ended in 1990 and this new geopolitical reality led to the spread of democracy and increased participation in the global economy.

Since then rapid and sustained economic growth has led commentators to observe that “Africa is rising.”⁵³ Critics warn that while there is growth,⁵⁴ the Africa rising narrative fails to recognize a lack of structural change.⁵⁵ African economies still largely rely on exporting resources and importing finished products.⁵⁶

In this context, international focus on access and benefit sharing of genetic resources led to the adoption of the *Nagoya Protocol* as part of the Convention on Biodiversity. The Convention provides a mechanism to protect and reward traditional knowledge, acknowledging its role in responding to climate change. Innovative responses to these structural challenges range from scaling up traditional textile products to MPESA, Kenya’s mobile money transfer system.⁵⁷

⁵¹ UNAIDS, “Number of People Living with HIV, 1995”, “Number of AIDS-Related Deaths, 1995” online: <<http://aidsinfo.unaids.org>>

⁵² WTO, *Ministerial Declaration on the TRIPS agreement and public health* (held in Doha on 9-14 November, 2001), WT/MIN(01)/DEC/2, 4th Sess.

⁵³ “The Hopeful Continent: Africa Rising” *The Economist* (3 December 2011) online: <www.economist.com/node/21541015>.

⁵⁴ See e.g. Augustin Kwasi Fosu, “Growth, Inequality and Poverty in Sub-Saharan Africa: Recent Progress in a Global Context, (2015) 43:1 Oxford Development Studies 44.

⁵⁵ Morten Jerven, *Africa: Why Economists Get it Wrong*, (London, UK: Zed Book, 2015).

⁵⁶ Ian Taylor, “Is Africa Rising?” (2014) 21:1 Brown J World Aff 143 at 155.

⁵⁷ Adebambo Adewopo, Helen Chuma-Okoro, & Adejoke Oyewunmi, “A Consideration of Communal Trademarks for Nigerian Leather and Textile Products” in Jeremy de Beer et al, eds, *Innovation & Intellectual Property: Collaborative Dynamics in Africa* (Cape Town, SA: UCT Press, 2014); Wilfred Mutua Mworia, “Mobile Technology Innovation Ecosystem in Kenya” in Olugbenga Adesida, Geci Karuri-Sebina, & Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group, 2016).

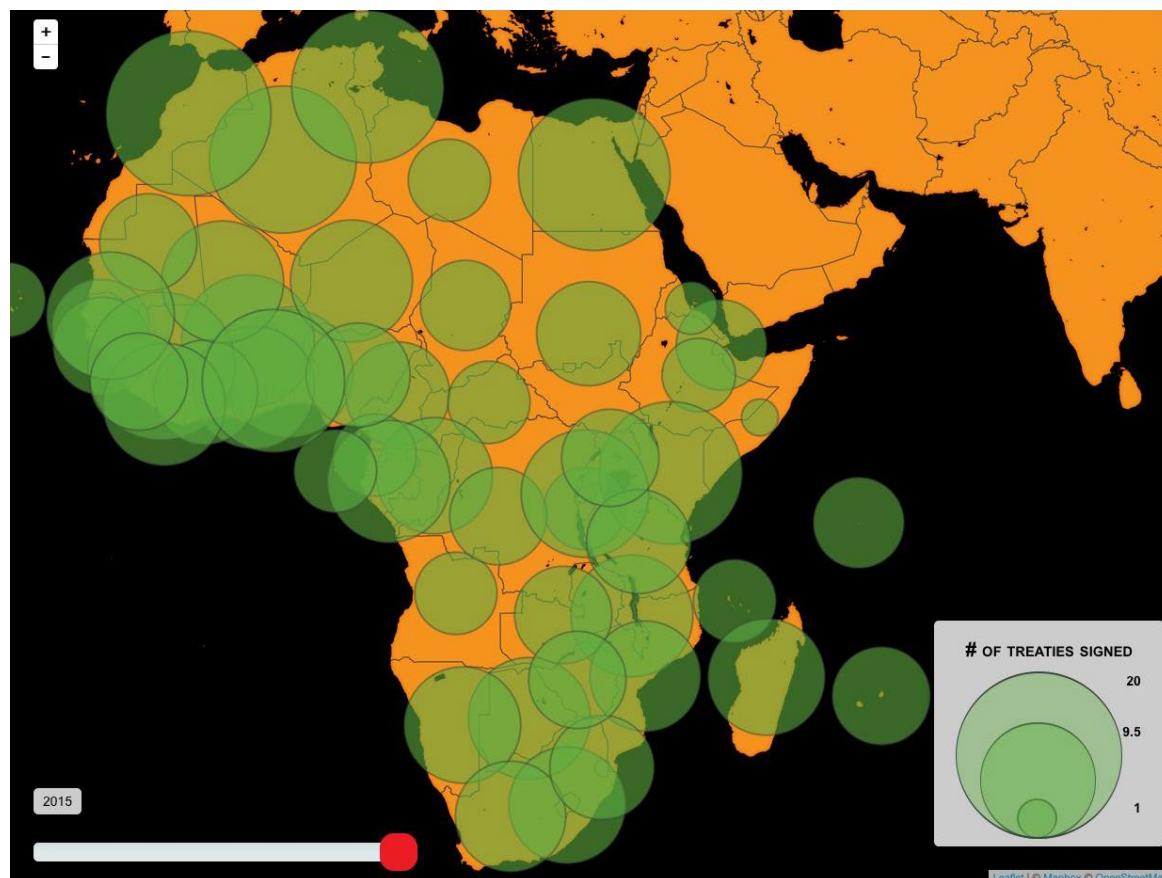


Figure 4: African Treaty Landscape in 2015

While research documents how many African innovators are taking a collaborative approach to IP,⁵⁸ IP treaties continued to saturate the continent. By 2015, all African countries except for South Sudan were party to one or more treaty. On average, countries were bound by nine treaties, with a standard range of between five and 14 treaties. Half of all countries had signed eight or more treaties with Morocco having signed 20 treaties. Morocco was also involved in the negotiation of the controversial Anti-Counterfeiting Trade Agreement, a separate agreement not formally covered within the scope of our data and analysis.

Most countries are now covered by TRIPS. Of the 10 countries that are not members, all but four have ratified the *Berne* and *Paris Conventions*. Eritrea, Ethiopia, Somalia, and South Sudan are the only countries not bound to these foundational IP norm-making instruments. Table 5 shows rates of subscription to international treaties as a percent of the total number of treaties signed.

A new approach towards treaty relations emerged as the Doha Round of TRIPS allowed developing countries to use generic versions of patented anti-retroviral medicines to

⁵⁸ Jeremy de Beer, Chidi Oguamanam, & Tobias Schonwetter, "Innovation, Intellectual Property and Development Narratives in Africa" in Jeremy de Beer et al, eds, *Innovation & Intellectual Property: Collaborative Dynamics in Africa* (Cape Town, SA: UCT Press, 2014).

treat the AIDS epidemic.⁵⁹ The leadership of African states in the adoption of the Doha Declaration, beginning with Zimbabwe's call for a special TRIPS Council session on access to medicines, is well documented.⁶⁰ Within WIPO, African states' contribution to the adoption of the Development Agenda is also well chronicled.⁶¹ A total of 34 treaties make up the international IP regime.

⁵⁹ James Love, "What the 2001 Doha Declaration Changed" (16 September 2011) *Knowledge Ecology International* (blog), online: <www.keionline.org/node/1267>.

⁶⁰ John S Odell & Susan K Sell, "Reframing the Issue: The WTO Coalition on Intellectual Property And Public Health, 2001" in John S Odell, ed, *Negotiating Trade: Developing Countries in the WTO and NAFTA* (Cambridge, UK: Cambridge University Press, 2006) at 85.

⁶¹ Tshimanga Kongolo, *African Contributions in Shaping the Worldwide Intellectual Property System* (London, UK: Routledge, 2013).

Conclusion: Opportunities for Innovation

The 130-year history of IP treaty adoption across Africa tells a colonial and neo-colonial story of the creation of a globalized IP system. The developed world imposed IP policies that benefited Western rights holders while limiting African participation in negotiating new treaties. As a result, IP policies do not reflect the realities in many African countries, contributing to poor performance on global metrics of innovation.

Despite the saturation of IP treaties across the African continent, opportunities still exist for policy innovation. Although international norms are largely set by TRIPS, African countries vary considerably in their membership in a number of other relevant treaties. Additionally, implementation and enforcement on the ground varies from country to country.

A made-in-Africa approach to IP policy will lead to benefits in inclusive innovation and development. Our database provides a tool to empirically test this hypothesis across time. Future research will use inferential statistics to examine relationships between rates of treaty membership and human development, measures of innovation, and metrics of economic growth. We gathered treaty ratifications as a proxy of the legal status of IP laws within each country. WIPO includes information about IP laws for each country. Quantitative and legal assessments of these laws will provide a more complete perspective on local realities.

Bibliography

International Treaties

Arrangement de la Haye Concernant Le Dépôt International des Dessins ou Modèles Industriels (Hague Agreement) 6 November 1925, WIPO Lex, online: <www.wipo.int/wipolex/en/treaties/text.jsp?file_id=280732>.

Arrangement de Madrid Concernant la Répression des Fausses Indications de Provenance sur les Marchandises (Madrid Agreement, Indications of Source) 14 April 1891, WIPO Lex, online: <www.wipo.int/wipolex/en/treaties/text.jsp?file_id=281783>.

Convention de Berne pour la Protection des Œuvres Littéraires et Artistiques (Berne Convention) 9 September 1886, WIPO Lex, translated online: <http://keionline.org/sites/default/files/1886_Berne_Convention.pdf>.

Convention on Biological Diversity, “Parties to the Nagoya Protocol” accessed: 4 Sept 2016, online: <www.cbd.int/abs/nagoya-protocol/signatories/default.shtml>.

International Union for the Protection of New Varieties of Plants, “UPOV Lex: Convention Notifications” accessed: 4 Sept 2016, online: <www.upov.int/upovlex/en/notifications.jsp>.

——— *Records of the Geneva Diplomatic Conference on the Revision of the International Convention for the Protection of New Varieties of Plants, 1978* (Geneva: UPOV, 1981).

——— *Records of the Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants, 1991* (Geneva: UPOV, 1992).

Protocol Regarding Developing Countries, *Berne Convention for Protection of Artistic and Literary Works, as revised at Stockholm*, 14 July 1967 WIPO Lex, online: <www.wipo.int/wipolex/en/details.jsp?id=12801>.

The International Treaty on Plant Genetic Resources for Food and Agriculture, “Contracting Parties to the Treaty” accessed: 4 Sept 2016, online: <www.planttreaty.org/list_of_countries>.

Vienna Convention on Succession of States in Respect of Treaties 6 November 1978, 1946 UNTS 3.

World Intellectual Property Organization, *Records of the Budapest Diplomatic Conference for the Conclusion of a Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure* (Geneva: WIPO, 1977).

——— *Records of the Diplomatic Conference for the Conclusion of a Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks, 1989* (Geneva: WIPO, 1991).

——— *Records of the Diplomatic Conference for the Conclusion of a Treaty on the Protection of Intellectual Property in Respect of Integrated Circuits* (Geneva: WIPO, 1989).

——— *Records of the Nairobi Diplomatic Conference for the Adoption of a Treaty on the Protection of the Olympic Symbol* (Geneva: WIPO, 1981).

——— *Records of the Washington Diplomatic Conference on the Patent Cooperation Treaty, 1970* (Geneva: WIPO, 1972).

Secondary Materials

Adesida, Olugbenga; Geci Karuri-Sebina and Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group Publishing, 2016).

Adewopo, Adebambo; Helen Chuma-Okoro, & Adejoke Oyewunmi, “A Consideration of Communal Trademarks for Nigerian Leather and Textile Products” in Jeremy de Beer et al, eds, *Innovation & Intellectual Property: Collaborative Dynamics in Africa* (Cape Town, SA: UCT Press, 2014).

Baarb , Jeremiah. “Interactive Map Showing the Status of IP Treaties in Africa, 1885-2015” (2016) online: <<http://lawbrowser.ca>>.

——— “Status of Treaties Interactive Map” (Source Code Repository) Github.com, online: <<https://github.com/baarseh/SoT-InteractiveMap>>.

Bodenh sen, G C. *Guide to the Application of the Paris Convention for the Protection of Industrial Property as Revised at Stockholm in 1967*, (Berne: BIRPI, 1969), online: <books.google.ca/books?id=EDful0T5rxQC>.

de Beer, Jeremy. “Applying Best Practice Principles to International Intellectual Property Lawmaking” (2013) 44:8 IIC - International Review of Intellectual Property and Competition Law 884.

——— “Evidence-based Intellectual Property Policymaking: A Review of Methods and Conclusions” (2016) 19:5-6 Journal of World Intellectual Property 150.

———; Chidi Oguamanam, & Tobias Schonwetter, “Innovation, Intellectual Property and Development Narratives in Africa” in Jeremy de Beer et al, eds, *Innovation & Intellectual Property: Collaborative Dynamics in Africa* (Cape Town, SA: UCT Press, 2014).

———; Jeremiah Baarb , Caroline B Ncube “Status of IP Treaties in Africa Database” (2016) Airtable.com, online: <<https://airtable.com/shrzv2z90oLqPPA6Q>>.

Deere, Carolyn. “The Politics of Intellectual Property Reform in Developing Countries: The Relevance of the World Intellectual Property Organization” in N Weinstock Netanel, ed, *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford, UK: Oxford University Press, 2008) 111.

——— *The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries* (Oxford, UK: Oxford University Press, 2008).

Donohue, Richard G; Carl M. Sack, Robert E. Roth, “Time Series Proportional Symbol Maps with Leaflet and jQuery” (2013) online: <www.cartographicperspectives.org/index.php/journal/article/view/cp76-donohue-et-al/1307>.

Frankel Susy & Daniel J. Gervais, *Advanced Introduction to International Intellectual Property* (Glos, UK: Edward Elgar Publishing, 2016).

Forero-Pineda, Clemente. “The Impact of Stronger Intellectual Property Rights on Science and Technology in Developing Countries” (2006) 35 Research Policy 808.

- Fosu, Augustin Kwasi. "Growth, Inequality and Poverty in Sub-Saharan Africa: Recent Progress in a Global Context, (2015) 43:1 Oxford Development Studies 44.
- Gathii, James Thuo. "Strength in Intellectual Property Protection and Foreign Direct Investment Flows in Least Developed Countries" (2015) Loyola University Chicago School of Law Research Paper No. 2015-011 online:
<<https://ssrn.com/abstract=2611369>>.
- Google. "Countries.csv" Open Dataset Canonical Concepts, online:
<developers.google.com/public-data/docs/canonical/countries_csv>.
- Heller, Michael A & Rebecca S Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research" (1998) 280:5364 Science 698, online:
<<http://science.sciencemag.org/content/280/5364/698.full>>.
- Jerven, Morten. *Africa: Why Economists Get it Wrong*, (London, UK: Zed Book, 2015).
- Kongolo, Tshimanga. *African Contributions in Shaping the Worldwide Intellectual Property System* (London, UK: Routledge, 2013).
- "Historical Developments of Industrial Property Laws in Africa" (2013) 5:1. WIPO J 105.
- "Historical Evolution of Copyright Legislation in Africa" (2014) 5:2 WIPO J 163.
- Lazar, Alan H. "Developing Countries and Authors' Rights in International Copyright" (1969) 19 Copyright L Symp 1 online:
<heinonline.org/HOL/LandingPage?handle=hein.journals/cpyrgt19&div=7&id=&page=>.
- Leaflet. "An Open-Source JavaScript Library for Mobile Friendly Interactive Maps" online:
<leafletjs.com>.
- Lessig, Lawrence. *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity* (New York: Penguin Press, 2004) online:
<<http://www.free-culture.cc/freeculture.pdf>>.
- Love, James. "What the 2001 Doha Declaration Changed" (16 September 2011) *Knowledge Ecology International* (blog), online: <www.keionline.org/node/1267>.
- Mapbox. "Mapbox Studio" online: <www.mapbox.com/mapbox-studio>.
- Mazrui, Ali A & C Wondji eds *General History of Africa Volume VIII: Africa since 1935* (Paris: UNESCO, 1993).
- Morin, Jean-Frederic; Kevin Daley, and E Richard Gold, "Having Faith in IP: Empirical Evidence of IP Conversions" (2011) 3:1 The WIPO Journal 93.
- Muchie, Mammo. "Towards a Unified Theory of Pan-African Innovation Systems and Integrated Development", Olugbenga Adesida, Geci Karuri-Sebina & Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group Publishing, 2016).
- Mworia, Wilfred Mutua. "Mobile Technology Innovation Ecosystem in Kenya" in Olugbenga Adesida, Geci Karuri-Sebina, & Joao Resende-Santos, eds, *Innovation Africa: Emerging Hubs of Excellence* (Bingley, UK: Emerald Group, 2016).

- Ncube, Caroline B; et al, "Assessing Regional Integration in Africa VIII: Background Paper on Intellectual Property Rights and Innovation" Open AIR Working Paper 5 (5 May 2017).
- Ncube, Caroline B. *Intellectual Property Policy, Law and Administration in Africa: Exploring Continental and Sub-regional Co-operation* (London, UK: Routledge 2016).
- — — "Three Centuries and Counting: The Emergence and Development of Intellectual Property Law in Africa" in Rochelle C Dreyfuss & Justine Pila, eds, *The Oxford Handbook of Intellectual Property Law* (Oxford, UK: Oxford University Press, Forthcoming) online: <<https://ssrn.com/abstract=2828680>>
- Odell, John S & Susan K Sell, "Reframing the Issue: The WTO Coalition on Intellectual Property And Public Health, 2001" in John S Odell, ed, *Negotiating Trade: Developing Countries in the WTO and NAFTA* (Cambridge, UK: Cambridge University Press, 2006)
- Okediji, Ruth L. "The International Relations of Intellectual Property: Narratives of Developing Country Participation in the Global Intellectual Property System" (2003) 7 Singapore J Intl & Comparative L 315.
- Peukert, Alexander. "The Colonial Legacy of the International Copyright System" in Ute Röchenthaler & Mamadou Diawara, eds, *Copyright Africa: How Intellectual Property, Media and Markets Transform Immaterial Goods* (Canon Pyon, UK: Sean Kingston Publishing, 2016) 37.
- Rahmatian, Andreas. "Neo-Colonial Aspects of Global Intellectual Property Protection" (2009) 12:1 J World Intell Prop 40 online: <www.farzadalvi.com/wp-content/uploads/2012/01/Rahmatian-2009.pdf>.
- Schneider, Patricia Higinio. "International Trade, Economic Growth and Intellectual Property Rights: A Panel Data Study of Developed and Developing Countries" (2005) 78 J Development Economics 529.
- Shillington, Kevin. *History of Africa* (New York: St. Martin's Press, 1989).
- Strba, Susan Isiko. *International Copyright Law and Access to Education in Developing Countries: Exploring Multilateral Legal and Quasi-Legal Solutions* (Martinus: Nijhoff Publishers, 2012).
- Taylor, Ian. "Is Africa Rising?" (2014) 21:1 Brown J World Aff 143.
- "The Hopeful Continent: Africa Rising" *The Economist* (3 December 2011) online: <www.economist.com/node/21541015>.
- United Nations Economic Commission for Africa, *Innovation, Competitiveness, and Regional Integration: Assessing Regional Integration in Africa VII* (Addis Ababa, Ethiopia: Economic Commission for Africa, 2016).
- UNAIDS, "Number of People Living with HIV, 1995", "Number of AIDS-Related Deaths, 1995" online: <<http://aidsinfo.unaids.org>>.
- World Intellectual Property Organization, "WIPO-Administered Treaties" *WIPO* (website), online: <<http://www.wipo.int/treaties/en/>>.

- WIPO-Administered Treaties, “Contracting Parties > Berne Convention (Total Contracting Parties: 172)” WIPO, online: <www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=15>.
- WIPO-Administered Treaties, “Contracting Parties > Berne Convention > Stockholm Act (1967)” WIPO, online: <www.wipo.int/treaties/en/ActResults.jsp?act_id=23>.
- WTO, *Ministerial Declaration on the TRIPS agreement and public health* (held in Doha on 9-14 November, 2001), WT/MIN(01)/DEC/2, 4th Sess.



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