

1 Introduction: Governing Openness in an Unequal World

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Introduction

This book is about the practices of openness in international development, and how they serve (or do not serve) inclusive development goals. It builds on and extends the theory articulated in the 2013 book *Open Development: Networked Innovations in International Development*, by deepening the understanding of how the design and deployment of *openness in practice* affects inclusion. When that book was written, open development was a relatively new phenomenon, with limited empirical research. As such, it aimed to document open development activities and their theoretical potential role in social change. Since then, a proliferation of openness practices and concomitant research have emerged, which makes this area ripe for deeper analysis.

This volume represents a synthesis of the research on open development that Canada's International Development Research Centre (IDRC) has been supporting since 2009. Each chapter delves into different aspects of how openness functions in practice in a wide range of contexts and environments. The authors use a variety of approaches to explore the relationship between openness and inclusive development, and, in some cases, critique or problematize its connections to human development. The aim is to present empirically informed critical perspectives and constructive lessons drawn from the research to inform and improve open development practice to ensure that it fulfills its inclusive promise.

This chapter lays out the central question driving the book: what is the connection between open development practices and inclusion (in its manifold political and socioeconomic forms) in the Global South? It starts with a brief discussion of what we mean by openness, inclusion, and development, and how these concepts interconnect. It then problematizes openness and inclusive development by unpacking inequalities in the Global South—the primary research context in this book—and discusses instances when openness has led to inclusive development outcomes and when it has

not. Finally, the chapter connects openness and governance of the knowledge commons, which are important to the open development puzzle overall and to the analysis in this book.

Openness, Inclusion, and Development

Openness, inclusion, and development are tricky concepts to unpack and to understand. The term “openness” has multiple meanings and interpretations, associated as it is with a verb (to open), a noun (openness), and an adjective (an open door). And, of late, a wide range of online content and social practices have coopted the term to give ideas, platforms, and applications a veneer of availability or transparency. Indeed, “open” is increasingly associated with nearly anything available on the Internet.

Inclusion and development are similarly contested concepts. In the contexts in which IDRC works, “to include” and “to develop” (or “Who is included?” and “What is development?”) are normative statements (and questions) that are built on assumptions about optimizing the good for the greatest number, and on goals of supporting human beings in their quest to achieve their highest aspirations. Yet unpacking inclusion and development into calculable, knowable, empirical notions is not an easy task. As goals—or rather, *pillars*—both seem to be a function of unique experience and positionality. For example, indicators such as gross domestic product (GDP) show something about a context in which people are living, but they do not speak to genuine happiness or well-being (which, at least for some, development and inclusion are meant to support).

You can imagine, then, that combining ill-defined concepts to describe open development might cause confusion, and, in our experience, it has. Indeed, some argue that a singular definition is undesirable and ultimately hypocritical, as it *closes* off other alternatives (Davies et al. 2013). Fortunately, complete agreement on a singular definition is not essential in order for learning to occur. But to help bridge at least some of these communication gaps, we have focused on a definition of “open” as it *exists in practice* (which is spelled out in detail in chapter 2) so there can be clarity about *the actual practices* under discussion. We might not all agree with the use (or not) of the word “open,” but we can point to an activity happening in the world as signifying an open practice. We have found this to be a fruitful approach.

In contrast to our attempts to achieve some clarity with the concepts of open and openness, we have allowed for flexibility around the meaning of and perspectives on development and inclusion across the contributions in this volume. As Global North

authors, schooled in the social sciences in Europe and North America, we hold our own views on what constitutes development and inclusion. In this volume, we have tried our best not to impose our definitions, in order to allow the volume's authors freedom in defining the territory according to their contexts. Thus, the meaning and expression of inclusion (who is included) and development (how and for what/whom) are determined by each of the authors of this volume, who themselves are drawing on diverse perspectives and practices in a variety of domains.

Now that we have successfully muddled the issue, let us explore what “open development” means. A few examples help set the stage and point to a tentative definition.

Example: Open Educational Resources in Afghanistan

More children are enrolled in school in Afghanistan now than in any other time in the country's history. Yet teachers there struggle to find materials appropriate for their classrooms that are available in the three languages taught in Afghan public schools: Dari, Pashto, and English. Openly licensed learning materials are changing this, making new and relevant content available in Afghanistan through an online portal, Darakht-e Danesh.¹ These learning resources can be adapted and adopted to fit the various curricula and contexts. They enable teachers to download, repurpose, print, copy, and use the materials—as well as to contribute their own content—and to engage students in new ways of learning.

Example: Open Data in Burkina Faso

Supporting free and transparent elections in a country transitioning from single-party rule poses many challenges. Perhaps the most critical concerns for democracy are instilling trust in the electoral process and preventing prolonged uncertainty about the results. Burkina Faso's Commission Électorale Nationale Indépendante (CENI) confronted these challenges when administering the country's election in November 2015. Ensuring political buy-in for the processing and publication of verified election results was one concern that CENI could address by collaborating with the Burkina Open Data Initiative² and the Open Data Institute.³ The resulting Open Elections project supported CENI with a web application that enabled citizens to access election results instantly as they were validated on Election Day. This improved the flow and accessibility of election information such that, just over 24 hours after the polls closed, results were announced, and accepted, by all candidates. The Burkina Faso experience of using open-data tools, skills, and technologies during the election illustrates the potential of sharing data to augment transparency and credibility during moments of political transition.

Example: Open Science in Lebanon

Rural water supplies—negatively affected by pollution and the dumping of waste and hazardous chemicals—are a crucial concern for many communities in Lebanon. And the people living near these water sources are arguably the best positioned to monitor supplies and alert municipal representatives when there are issues. So communities across Lebanon, in partnership with the American University of Beirut–Nature Conservation Center (AUB-NCC), are using crowdsourced citizen data to monitor water supplies, reduce untreated wastewater, and improve recycling and reuse methods. Village committees meet with chemists, engineers, and community development specialists from the AUB-NCC to learn how to test water supplies and exchange information on water-quality issues. Citizen scientists conduct experiments with low-cost monitoring toolkits and generate their own data on the quality of water supplies. Water committees then organize meetings to disseminate and discuss their findings with the community at large, and follow up with municipal and local legal authorities to find ways of improving water quality with new, affordable technologies. In one village, the project has even led to a permanent water-testing lab overseen by the water committee. Supported by the findings from citizen scientists and grassroot-level collaborations, the AUB-NCC is helping communities generate remedial solutions and reach out to local decision-makers, companies, investors, and other communities across Lebanon to improve water supplies.⁴

These three examples—all research case studies featured in this book—demonstrate how the open production, distribution, and use of knowledge resources can support broader human development objectives. Innovations in openness, from open government to open science, are often characterized by their potential benefit to society in many arenas of social activity and organization. Indeed, openness can affect any domain where information and knowledge contribute to social change—data, policymaking, budgets, education and educational resources, science, research data, software, and innovation, to name only a few.⁵

This book documents many examples of these activities and provides numerous cases of openness practices that contribute to achieving inclusive development aims. While open development covers a wide range of activities emerging from theoretically and practically diverse origins, at its core are questions of institutional governance in the production and sharing of knowledge resources to achieve development aims. We discuss the origin and definition of open development more thoroughly in chapter 2 of this volume.

While open development has different historical roots, the diverse practices that it implies are typically inspired by a value system that recognizes openness as a good thing. This stems from the view that open practices can offer cost-effective means of

tackling pressing problems of inequity and inequality. Open educational resources (OER), for instance, offer new and virtually cost-free (to the user) resources for learning that can be adapted to local contexts, although there may be associated access costs for users, such as those for connectivity and data to access the resources. Similarly, the transparency and accountability afforded by open governance resources, like open data or open budgets, can be leveraged to uncover not only the existence of socioeconomic inequality, but also the political and economic root causes.

Openness innovations do not just potentially affect development outcomes, though. They also bring into question, rearrange, or even overturn basic assumptions about how to go about development work in practice and who should play what roles (Smith and Reilly 2013). For example, the ability to tap into collective intelligence has brought into question the predominance of the role of experts in many situations, such as when teachers take advantage of the freedom associated with OER to engage students in the creation of course content by drawing on each student's own experiences and knowledge. Similarly, the emergence of crowdfunding and crowdlending for development-related activities like building schools or roads and supporting young entrepreneurs in rural communities challenges what was once primarily the ambit of more traditional bilateral development agencies from the Global North.

More significantly, perhaps, open development creates a space for a reboot of development theory and practice itself. Open development innovations provide novel institutional arrangements in the production and distribution of knowledge and creative works that challenge the dominant development paradigm of a market-led information society (Benkler 2006; Reilly and Smith 2013; Mansell 2013). As Mansell explains, "The 'open' or commons-led alternative imaginaries are characterized by some form of 'digital resistance' to the universal model of the information society. This usually involves some form of countervailing power, a privileging of co-operation and collaboration over competition, and innovative forms of networked collaboration often by dispersed communities" (2013, 11).

Open Development in an Unequal World

The links between openness, inclusion, and development are not always straightforward or direct. The capabilities required to access and engage in open activities vary greatly across people and populations. These differential capabilities across the world are a function of a myriad of social and individual factors, such as infrastructure for mobile phone and Internet access, affordability of pricing structures, education levels, cultural attitudes toward women and girls, and more.

To understand the research and analysis presented in this book, it is imperative to situate the work within the time and context in which it all took place (from about 2009 to 2018) and the overall trends in international development during this period. There was a major recession that affected the world's economy (and led to disruptive austerity measures in Europe) after the financial crisis in 2008. Antigovernment protests in Tunisia in 2011 sparked a wave of political (and then repressive) action across North Africa and the Middle East, which in turn ushered in a war in Syria and the rise of the Islamic State of Iraq and Syria (ISIS), both online and on the ground. We have also seen an increase around the world in nationalism and authoritarianism and a turn away from the principles of international collaboration and cooperation. This includes movements away from earlier commitments to openness, such as Tanzania, Hungary, and Turkey withdrawing from the Open Government Partnership; the 2016 election of a US president who has undermined the open government approach of his predecessor; and the election of numerous leaders in the Global South for whom transparency, accountability, dissent, equitable development, and gender equality are not a priority, or even a part of their governance model.

These global shifts have been accompanied by the diffusion of new online communication and networking tools and platforms, particularly the increasing use of mobile technologies and social media applications. Yet the surge in user-generated content on self-styled web platforms and pages that marked earlier manifestations of the Internet have been increasingly scooped up by online data behemoths like Google and Facebook. Though the wider availability of broadband and mobile connectivity globally has provided billions of people with new communication channels and lowered historical barriers to entry in the information and communication marketplace, new users are now increasingly flocking to a narrowing number of online platforms run by only a few companies. As we see in chapter 5, in some instances, these platforms play a significant role in the potential for shared content to be discovered and used.

Indeed, the reliance on popular platforms like Facebook as the *de facto* digital public sphere and source for news in many countries is further limiting the possibility for genuine engagement. In contrast to the democratization of the public sphere promised by the decentralized Internet architecture, the existence of a few highly used platforms has centralized the flow of information for many individuals. This results in a high concentration of information power that can then be leveraged by new machine-learning techniques for highly targeted “precision propaganda” campaigns (Ghosh and Scott 2018, 5; Smith and Neupane 2018). This is particularly concerning in countries where ethnic or other tensions already exist. For instance, there are cases where misinformation spread through Facebook contributed to inciting violence in South Sudan, and a viral WhatsApp message provoked retaliatory lynchings in eastern India (Roose 2017).

There are now daily examples in the news of how misinformation is impacting people and political systems. This threat will likely only deepen with the development of artificial intelligence techniques that allow the creation of compellingly realistic fake video and audio files of speeches (*Economist* 2017). This proliferation of freely shared news content as a key means of spreading misinformation and propaganda poses a legitimate threat to democracy (Persily 2017).

Along with this, the ever-increasing amount of data being generated from our online activities is having a broad and often not well understood impact on our rights online—particularly for our privacy and security. The massive increase in online activity and available user data is exponentially increasing surveillance capabilities—not only for state actors from the intelligence communities, but also for private corporations, hackers, and other rogue or non-state actors. This concurrent expansion of surveillance capabilities knows almost no state boundaries and is almost completely unregulated. Although not always well understood by the average user, these kinds of issues have a chilling effect on free expression and undermine trust in online systems over time.

Enduring issues for the bottom billion persist as well. There is, for example, worsening inequality and inequity that persist between and within countries, among rural and urban populations, between women and men, and amid historically marginalized groups, such as Indigenous and ethnic minority populations. Research from the United Nations Development Programme (UNDP) and from the World Bank shows that inequality is rising within countries, and absolute inequality, as measured by the Gini coefficient, has increased dramatically in the past forty years (UNDP 2016, 30–31).⁶ Recently, this increase has become even more dramatic, massively disadvantaging the poorest: “Since 2000, 50 percent of the increase in global wealth benefited only the wealthiest one percent of the world’s population. Conversely, the poorest 50 percent of the world’s population received only one percent of the increase” (UNDP 2016, 31).

Similarly, access to the benefits of the digital revolution remains radically uneven. Despite the rapid spread of mobile devices and broadband Internet around the world, nearly 2 billion people still do not use mobile phones, even though 7 billion people (or 95 percent of the global population) live in areas covered by a cellular network (ITU 2016). And nearly 4 billion people are not using the Internet at all, constituting 53 percent of the global population (ITU 2016). International Telecommunications Union (ITU) data show that “3.9 billion people remain cut-off from the vast resources available on the Internet, despite falling prices for ICT services” (ITU 2016). Only 15 percent of the world can access high-speed Internet (UNDP 2016, 31).

All of this means that even as broadband infrastructure, especially mobile broadband, has become more available in rural areas, last mile challenges,⁷ the cost of handsets, and

access to bandwidth continue even now to confine broadband usage to wealthier segments of the population. Considering these figures in relation to the digital gender gap, women have far less access to the Internet than men in many, if not most, parts of the world. Globally, the difference is 44.9 percent for women versus 51.1 percent for men; but in developing countries, it is 37.4 percent for women versus 45 percent for men (ITU 2016, 3).⁸

In sum, open development activities are happening in a challenging climate. There is a recent slight trend where countries are actively rejecting the principles of openness, as well as an increase in the risks of engaging online, particularly in the political sphere. Genuine engaged participation among the poorest and least connected in the public sphere, both online and on the ground, remains limited. Most digital engagement still requires reliable access to the Internet, use of computers or smartphones, and expendable income to pay for data access. Sometimes these differences are referred to as “digital poverty” rather than the “digital divide.” The divide has been described as a lack of access to and full use of the information and communications allowed by the technology tools caused not just by deficient connectivity, but also by lack of demand, often related to inadequate income, and lower capacity, due to literacy or skill deficits (Barrantes 2007; also see chapter 9).

Openness = Less Equality?

Given that the contributions of technology to social change are a function of a myriad of contextual factors, it could be that innovations in openness are contributing to and exacerbating existing inequalities. Indeed, some research on openness has uncovered examples where it has led to less, rather than more, equitable outcomes in a broad range of openness activities.

For example, in the area of open data, Rumbul (2015) looked into who engages with open government data projects seeking to increase public engagement and participation in Kenya and South Africa, and found disparities among users and nonusers along gendered and educational lines. Across the projects she examined, around 70 percent of users were male and a majority of users were educated (Rumbul 2015, 13). Indeed, both open government and open data seem to require tempered or deconstructed optimism, and both are currently suffering somewhat from the shift in global politics and political alignments that displace transparency and accountability from the main agenda. A key research finding in the Open Data Barometer (2017) is that the overall readiness of governments to adopt and implement open data initiatives has been regressing. It is also the case that government transparency in some contexts might undermine good

governance (Lessig 2009; Bannister and Connolly 2011). For example, open data can be biased, contributing to misinterpretation and misuse (Zuiderwijk and Janssen 2014), and openness around more sensitive types of data can lead to violations of the right to privacy (Martin and Bonina 2013). Moreover, open government initiatives are sometimes coopted to serve a deregulation agenda that generally benefits the private sector and wealthier echelons of society. Jo Bates noted, “As the most vulnerable in society are facing substantial public spending cuts, the OGD [open government data] model risks being interpreted as, and potentially becoming, little more than a corporate subsidy” (2012).

Along similar lines, in a synthesis of citizen-voice crowdsourcing initiatives, Peixoto and Fox (2016) found only seven (out of twenty-three) initiatives resulted in a high degree of governmental responsiveness. When analyzing whose voices were being collected, they found that those most in need were usually underrepresented (Peixoto and Fox 2016, 19)—perhaps due in part to the enduring digital poverty of those communities.

Other research shows that openness practices, such as peer collaboration, are incredibly challenging in low-resource settings (Berdou 2017). In this volume, Graham and De Sabbata (chapter 5) explore the data from online peer production platforms such as Wikipedia and find that use and participation are gendered and deeply unequal geographically (see also Graham and Hogan 2013). Similarly, a study of a microwork platform in Latin America, as discussed in chapter 14 of this volume, found a skewed distribution, where a very small number of freelancers ended up getting the most jobs. Furthermore, full participation on such platforms is not possible without access to computers with the appropriate software—something that is limited in low-resource settings.

Research on the use of MOOCs found that their users tend to have both higher socioeconomic status and more formal education. One study in the United States found that users of sixty-eight MOOCs offered by Harvard University and the Massachusetts Institute of Technology (MIT) “tended to live in more-affluent and better educated neighborhoods than the average US resident” (Hansen and Reich 2015, 1245). The researchers conclude that while such digital learning innovations might raise all boats, it could also lead to an increasing divergence in educational outcomes between low- and high-socioeconomic status groups. Christensen et al. (2013) similarly found that MOOC participants, particularly in middle-income countries like Brazil, Russia, India, China, and South Africa (aka the BRICS) and in other lower-income countries as well, are more likely to be employed, highly educated, and male.

The sharing of open access scholarly journal articles can also generate adverse dynamics that further marginalize academics and research from across the Global South (see chapter 6). One mechanism for this is the increasing dependence on only a few platforms for distribution and discovery of online knowledge resources, which can lead

to de facto monopolization and closure through algorithms that systematically favor some results over others. Until larger systemic issues are tackled, such as how metrics like the journal impact factor create bias by placing institutional pressure on authors to publish in particular journals (e.g., tenure predicated on publishing in top-impact journals) and journal editors' choices of what is an acceptably relevant article to publish (i.e., those articles that will be cited), these inequalities will most likely persist despite the emergence of open access (Chan and Gray 2013; Okune et al. 2016).

The fear, then, is that openness could be reinforcing the effect of accumulative advantage where the rich get richer, also known as the “Matthew Effect” (Merton 1968). This is not a surprising development (Gurstein 2011; Toyama 2011), particularly given current levels of inequality and the rise of reactionary authoritarianism, but it is nevertheless a challenge to open development optimism and the hypothesis that it is a force for inclusive development.

On the other hand, there is research that suggests there is room for hope for the openness hypothesis. Snijder (2013) found that over 70 percent of online usage data—from a set of 137 open access academic books—came from developing countries. This provides evidence that researchers from developing countries seek out and benefit from free academic books. Garrido et al. (2016) looked at the use and perceptions of MOOCs in Colombia, the Philippines, and South Africa and found that 80 percent of users come from low- and middle-income populations, and 80 percent have only basic or intermediate information technology skills. Furthermore, they found that women are more likely than men to complete a MOOC or obtain certification. Similarly, research on a teacher-training MOOC developed by Peking University in China found that 60 percent of participants came from the less-developed regions of China (Wang et al. 2018). Furthermore, Maitland and Obeysekare (2015) found that development-focused MOOCs can contribute to building students' social capital even beyond learning gains. And, of course, there are more examples outside of education, some of which can be found in this book.

Policy and Practice Dynamics in Openness

From the research discussed in this book, we can identify three openness-related policy and practice dynamics that contribute to the unequal distribution of benefits flowing from openness in Global South contexts.

First, concerted efforts have not yet been made consistently to overcome constraints and promote effective use. Theories of (and advocacy for) openness have focused on the production and distribution (i.e., the supply) of open content, while largely ignoring, or underresourcing, the use (i.e., the demand for) of the content. The goal for many,

but certainly not all, openness projects is to make digital content open, full stop—often for legitimate reasons. Furthermore, openness initiatives have mainly avoided the more contentious power relationships or have met with resistance when doing so. While we see a trend toward more ecosystemic and bottom-up approaches (some evidenced in this book), the literature produced thus far can teach us a lot about how to produce and share, but not as much about how to engage and support effective use.

Second, Global North values are embedded. Openness movements and a plurality of the openness innovations have come out of North America and Europe. In some cases, these innovations are funded by philanthropic foundations, and, in the Global South context, by international and bilateral aid agencies. This is especially true in areas such as open government data, open access, and OER. One consequence has been the emergence of openness best practices, underlying theories, and supporting technologies that implicitly contain the values and assumptions of these contexts, and that at times conflict with the realities of developing-country contexts. When this happens, these best practices can steamroll possibilities for important local adaptations.

Third, openness policy lags practice. As with many emergent technosocial innovations, it takes a while for policy to catch up. Many governments have begun to support openness at the national and international level, such as through OER policies or by joining the Open Government Partnership. Some countries, such as Uruguay, have been first movers in this space (Brazil at one time was also a first mover, but is looking less so at the end of 2019). However, the general trend is that governments have not yet figured out how to leverage the possibilities of openness to improve governance, education, health, and other development outcomes. Where there are well-intentioned policies, they are often not backed up by meaningful implementation, rendering the policies themselves irrelevant. And, in some circumstances, some open policies are short lived, undermined by policy reversals, lax implementation, underresourcing, and problems with institutionalization.

The point of this section is not to argue that openness leads directly to greater inequality—not at all. Neither is its purpose to present a wholly gloomy picture about openness activities in international development. Its point, rather, is to understand what happens in situations where openness has led to unequal outcomes, and to find alternate ways that practices and tools can be harnessed to allow openness to achieve its full potential. This is one of the aims of this book.

As is clear from this discussion, the relationship between openness, development, and inclusion is not straightforward. Open development innovations always have a form and a place, and it is the diversity of these forms and places that results in a wide range of outcomes. The chapters in this book explore a broad variety of experiences of

openness in developing-country contexts, across many domains and while uncovering a multitude of outcomes. This knowledge helps to deepen our understanding of the relationship between openness practices, their contexts, and development. It is from this contextualized learning that we can move to more applicable and generalizable lessons for practice and policy. We try to draw out such lessons in the concluding chapter of this book.

Indeed, the imperative for understanding and improving practices of openness is growing. If we view openness within its historical context, it can be understood both through a range of ideas about openness (such as open government) and through theories of development in the twentieth century (such as participatory development). These historical roots are important to understand because even as openness has grown in prominence globally, so has openwashing (Thorne 2009) and counternarratives that appear to close or partition knowledge.⁹

As previously discussed, some innovations in openness afforded by the Internet—for instance, open government data and open access to scholarly publishing—are under some threat by new institutional arrangements and reactionary politics. Indeed the actual closing of open data and open government initiatives, as well as the ending of net neutrality in the United States in 2018, could signal troublesome trends for open development. Boyle's (2003, 2008) predictions from over a decade ago (i.e., that we are headed toward a second enclosure movement rather than more openness) seem worryingly prescient thus far. We can see this happening on a technical level with the emergence of non-web-based applications and in the consolidation of online content by a handful of dominant providers. Now is the moment when policymakers and civil society need to work together to decide what our knowledge commons should and need to be, for the future, to support human potential and innovation.

So while the proliferation of open development innovation could be creating a moment of renewal for development theory and how the work of development is undertaken practically through the day-to-day work of policymaking and research, this moment will not necessarily last. The opportunity could fade if practitioners cannot harness it and make the alternative imaginary a feasible and tangible reality. This involves, in part, countering forces that are threatened by open practices and those people, places, and institutions that seek to maintain their privileged positions. In particular, the inclusivity inherent in the promise of open development must be realized to stir up and improve on the practices for which open development provides enhanced alternatives—like participatory practices or open government. Failing to leverage openness to facilitate inclusive change could translate into a closing of the alternative imaginaries that make open development so compelling.

Governing Open Development for Inclusion

Harnessing open development for inclusive development can be thought of as an issue of institutional governance in the production and sharing of knowledge resources to achieve equitable, inclusive development outcomes. In the same way that communities govern the knowledge commons (Frischmann et al. 2014), they also govern openness (knowledge governance is discussed in more detail in chapters 2 and 3 of this volume). This governance happens at four levels.

First, at a global level, the formal mechanisms of governance for the knowledge commons globally are embedded in relationships among and between states such as bilateral and multilateral trade-agreements. Currently, the trend is toward enclosing (i.e., commodifying) the commons through pushing for increasingly strict intellectual property (IP) regulation within global or regional trade agreements (de Beer and Oguanmanam 2013).

Second, at the national level, governance happens via the state and the market. This level includes IP; telecommunications policy; the current offering of Internet and mobile services; laws around censorship and freedom of expression, surveillance and privacy, and access to knowledge (Internet rights); and various facets of culture, socio-economics, and politics.

Third, at the provincial/state, municipal, and institutional levels, as well as via specific institutions where open development applications reside, there is often some level of autonomy in decision-making and policy direction that affects the shape and nature of openness. For example, some states and provinces might have specific open data or OER policies, and institutions such as specific universities might have an open access policy and a bespoke position on IP rights.

Fourth, there is governance at the level of the application. An application can be hyperlocal or global in scale and scope, depending on the open activity and the underlying technology that facilitates it. This includes a variety of elements that shape the possibilities and nature of human participation, such as the underlying technology and human interface; the related norms, values, and roles of the online community; and the substance and form of data, information, and knowledge. Several specific openness applications are discussed in this book, such as citizen-sourcing applications and collaborative platforms for creating and sharing OER.

The first three levels—the global, national, and state/institutional—can be thought of as the ecosystem within which open development applications, the fourth level, exist. All four levels, however, interact and affect the particular outcomes of the applications and the relative equity of their benefits.

Structure of the Book

This volume has three sections which cover defining open development, governing the open development ecosystem, and governing open development applications.

Part I, “Defining Open Development,” has two chapters that provide empirically informed theoretical underpinnings to the concept of open development. While the two chapters present different perspectives on how to frame open development, they agree that the production, distribution, and consumption of knowledge are the defining components.

Following that introductory material, the bulk of the book focuses on synthesizing lessons across research at either the ecosystem or application level. Part II, “Governing the Open Development Ecosystem,” has six chapters that examine issues and outcomes at the state and global level. These issues include the inequality of access and use of open knowledge resources, infrastructure (both technological and in terms of knowledge access), and economic and social policy.

Part III, “Governing Open Development Applications,” includes a series of in-depth treatments of interventions in specific domains of development, including governance, education, science, and informal innovation.

The concluding chapter summarizes and synthesizes the key takeaways from the book and looks forward to new issues emerging around the governance of the knowledge commons for development.

One cluster of issues that we do not cover in this book are those around openness in relation to privacy—such as issues of surveillance, data governance, and security/safety in relation to digital rights. We do have researchers from our portfolio of projects who work on these issues, but time constraints made the production of a chapter difficult. It is a rich and understudied territory, and we look forward to exploring it more in the future.

We hope that you enjoy the book.

Notes

1. For more on the Darakht-e Danesh library, see Oates (2017).
2. See more about the Burkina Faso Data Portal at <http://burkinafaso.opendataforafrica.org/>.
3. An open data platform, Open Data Burkina Faso (<http://data.gov.bf/>), with fifty open data sets, was launched by Burkina Faso’s national information and communication technology agency, Agence Nationale de Promotion des TIC (ANPTIC), in June 2014. For more on the case study, see Scott (2016).
4. For more about this case study, see Talhouk et al. (2019).
5. Other areas include open government and data, open legislation, open education and educational resources, open science and research data, open-source software, and open innovation.

6. The Gini coefficient or index is a measure of inequality that shows the income or wealth distribution of a nation's residents. See the Organisation of Economic Co-operation and Development's definition of the coefficient (<https://stats.oecd.org/glossary/detail.asp?ID=4842>).
7. The last mile challenge refers to the final leg of a telecommunications network meant to deliver services (telephone, internet, or television via cable for instance), often to underserved, remote areas that are not always economically viable because the cost of delivering the service is higher than the anticipated income. For a more thorough explanation, see the "Last Mile" entry on Wikipedia (https://en.wikipedia.org/wiki/Last_mile).
8. The context is more complicated than these figures indicate, though. For instance, household survey data from twelve African countries from 2011 to 2012 and 2007 to 2008 suggest that mobile ownership and Internet use are determined by users' income, education, and location, but *not* gender. See Khan (2016).
9. Thorne (2009) defines openwashing as: "to spin a product or company as open, although it is not. Derived from 'greenwashing.'" Openwashing extends beyond the private sector to the public and not-for-profit sectors as well.

References

- Bannister, Frank, and Regina Connolly. 2011. "The Trouble with Transparency: A Critical Review of Openness in e-Government." *Policy & Internet* 3 (1): 1–30.
- Barrantes, Roxana. 2007. "Analysis of ICT Demand: What Is Digital Poverty and How to Measure It?" In *Digital Poverty: Latin American and Caribbean Perspectives*, ed. Hernan Galperin and Judith Mariscal, 29–54. Ottawa: IDRC. <https://idl-bnc-idrc.dspacedirect.org/handle/10625/29762>.
- Bates, Jo. 2012. "'This Is What Modern Deregulation Looks Like': Co-optation and Contestation in the Shaping of the UK's Open Government Data Initiative." *Journal of Community Informatics* 8 (2). <http://ci-journal.net/index.php/ciej/article/view/845/916>.
- Benkler, Yochai. 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CT: Yale University Press.
- Berdou, Evangelia. 2017. "Open Development in Poor Communities: Opportunities, Tensions, and Dilemmas." *Information Technologies & International Development* 13:18–32.
- Boyle, James. 2003. "The Second Enclosure Movement and the Construction of the Public Domain." *Duke Law Journal* 66:33–74. <https://law.duke.edu/pd/papers/boyle.pdf>.
- Boyle, James. 2008. *The Public Domain: Enclosing the Commons of the Mind*. New Haven, CT: Yale University Press.
- Burkina Faso Data Portal. n.d. "Burkina Faso: Data at a Glance." <http://burkinafaso.opendataforafrica.org/>.
- Chan, Leslie, and Eve Gray. 2013. "Centering the Knowledge Peripheries through Open Access: Implications for Future Research and Discourse on Knowledge for Development." In *Open Development: Networked Innovations in International Development*, ed. Matthew L. Smith and Katherine

M. A. Reilly, 197–222. Cambridge, MA/Ottawa: MIT Press/IDRC. <https://www.idrc.ca/en/book/open-development-networked-innovations-international-development>.

Christensen, Gayle, Andrew Steinmetz, Brandon Alcorn, Amy Bennett, Deirdre Woods, and Ezekiel J. Emanuel. 2013. “The MOOC Phenomenon: Who Takes Massive Open Online Courses and Why?” November 6, SSRN. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2350964.

Davies, Tim, ed., Duncan Edwards, Linda Raftree, Mika Väilitalo, Pernilla Näsfors, Sarah Johns, Claudia Schwegmann, and Matthew L. Smith. 2013. “Exploring Open Development.” In *The Open Book*, ed. Kaitlyn Braybrooke, Jussi Nissilä, and Timo Vuorikivi, 45–61. London: Finnish Institute in London.

De Beer, Jeremy, and Chidi Oguamanam. 2013. “Open Minds: Lessons from Nigeria on Intellectual Property, Innovation, and Development.” In *Open Development: Networked Innovations in International Development*, ed. Matthew L. Smith and Katherine M. A. Reilly, 249–272. Cambridge, MA/Ottawa: MIT Press/IDRC. <https://www.idrc.ca/en/book/open-development-networked-innovations-international-development>.

The Economist. 2017. “Fake News: You Ain’t Seen Nothing Yet.” July 1; <https://www.economist.com/news/science-and-technology/21724370-generating-convincing-audio-and-video-fake-events-fake-news-you-aint-seen>.

Frischmann, Brett M., Michael J. Madison, and Katherine J. Strandburg. 2014. “Governing Knowledge Commons.” In *Governing Knowledge Commons*, ed. Brett M. Frischmann, Michael J. Madison, and Katherine J. Strandburg, 1–43. New York: Oxford University Press.

Garrido, Maria, Lucas Koepke, Scott Andersen, Andres F. Mena, Mayette Macapagal, and Lorenzo Dalvit. 2016. *The Advancing of MOOC Usage for Development Initiative: An Examination of MOOC Usage for Professional Workforce Development Outcomes in Colombia, the Philippines, and South Africa*. Seattle: Technology and Social Change Group, University of Washington.

Ghosh, Dipayan, and Ben Scott. 2018. *Digital Deceit: The Technologies behind Precision Propaganda on the Internet*. Washington, DC: New America Public Interest Technology Team. <https://www.newamerica.org/public-interest-technology/policy-papers/digitaldeceit/>.

Graham, Mark, and Bernie Hogan. 2013. *Uneven Openness Barriers to MENA Representation on Wikipedia: Final Technical Report*. Ottawa: IDRC. <http://hdl.handle.net/10625/53449>.

Gurstein, Michael. 2011. “Open Data: Empowering the Empowered or Effective Data Use for Everyone?” *First Monday* 16 (2). <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3316/2764>.

Hansen, John D., and Justin Reich. 2015. “Democratizing Education? Examining Access and Usage Patterns in Massive Open Online Courses.” *Science* 350 (6265): 1245–1247; <http://science.sciencemag.org/content/350/6265/1245.full>.

International Telecommunications Union. 2016. *Measuring the Information Society*. Vols. 1 and 2. Geneva, Switzerland: Author. <https://www.itu.int/en/ITU/Statistics/Documents/publications/misr2016/MISR2016-w4.pdf> and the press release: <https://www.itu.int/en/mediacentre/Pages/2016-PR30.aspx>.

Khan, Safia. 2016. "Taking the Microscope to ICT Gender Gaps in Africa." *CPRSOUTH (Communication Policy Research South) Conference. Inclusive Innovation*, Session 6, Zanzibar, Tanzania, September. http://www.cprsouth.org/wp-content/uploads/2016/09/CPRSOUTH-2016_PP83_Khan.pdf.

Lessig, Lawrence. 2009. "Against Transparency." *New Republic* October 9. <https://newrepublic.com/article/70097/against-transparency>.

Maitland, Carleen, and Eric Obeysekare. 2015. "The Creation of Capital through an ICT-Based Learning Program: A Case Study of MOOC Camp." In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development—ICTD '15*, 1–10. Singapore: ACM Press; <https://doi.org/10.1145/2737856.2738024>.

Mansell, Robin. 2013. "Introduction: Imagining the Internet: Open, Closed, or in Between." In *Enabling Openness: The Future of the Information Society in Latin America and the Caribbean*, ed. Bruce Girard and Fernando Perini, 9–20. Montevideo, Uruguay/Ottawa: Fundación Comunica/IDRC. <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/52195/IDL-52195.pdf?sequence=1&isAllowed=y>.

Martin, Aaron K., and Carla M. Bonina. 2013. "Open Government and Citizen Identities: Promise, Peril, and Policy." In *Open Development: Networked Innovations in International Development*, ed. by Michael L. Smith and Katherine M. A. Reilly, 223–248. Cambridge, MA/Ottawa: MIT Press/IDRC. <https://www.idrc.ca/en/book/open-development-networked-innovations-international-development>.

Merton, Robert K. 1968. "The Matthew Effect in Science." *Science* 159 (3810): 56–63. <http://www.garfield.library.upenn.edu/merton/matthew1.pdf>.

Oates, Lauryn, Letha K. Goger, Jamshid Hashimi, and Mubarak Farahmand. 2017. "An Early Stage Impact Study of Localised OER in Afghanistan." In *Adoption and Impact of OER in the Global South*, ed. Cheryl Hodgkinson-Williams and Patricia B. Arinto, 549–573. Cape Town/Ottawa: African Minds/IDRC; Cape Town, South Africa: Research on Open Educational Resources for Development. <https://www.idrc.ca/en/book/adoption-and-impact-oer-global-south>.

Okune, Angela, Becky Hillyer, Denisse Alborno, Nanjira Sambuli, and Leslie Chan. 2016. "Tackling Inequities in Global Scientific Power Structures." *African Technopolitan* 4 (1): 128–131. <https://tspace.library.utoronto.ca/bitstream/1807/71107/1/Tackling%20Inequities%20in%20Global%20Scientific%20Power%20Structures.pdf>.

Open Data Barometer. 2017. *Global Report*. 4th ed. Washington, DC: World Wide Web Foundation. https://opendatabarometer.org/?_year=2017&indicator=ODB.

Open Data Burkina Faso. n.d. "Home Page". <http://data.gov.bf/>.

Open Data Institute. n.d. "Home Page". <http://theodi.org/>.

Ortiz, Isabel, Sara Burke, Mohamed Berrada, and Hernan C. Saenz. 2013. *World Protests 2006–2013*. Working Paper No. 274. New York: Initiative for Policy Dialogue; Washington, DC: Friedrich-Ebert-Stiftung. <http://policydialogue.org/publications/working-papers/world-protests-2006-2013/>.

Peixoto, Tiago, and Jonathan Fox. 2016. *When Does ICT-Enabled Citizen Voice Lead to Government Responsiveness?* World Development Report 2016 Background Paper, World Bank. <https://openknowledge.worldbank.org/handle/10986/23650>.

Persily, Nathaniel. 2017. "Can Democracy Survive the Internet?" *Journal of Democracy* 28 (2): 63–76.

Reilly, Katherine M. A., and Matthew L. Smith. 2013. "The Emergence of Open Development in a Network Society." In *Open Development: Networked Innovations in International Development*, ed. Matthew L. Smith and Katherine M. A. Reilly, 15–50. Cambridge, MA/Ottawa: MIT Press/IDRC. <https://www.idrc.ca/en/book/open-development-networked-innovations-international-development>.

Roose, Kevin. 2017. "Forget Washington. Facebook's Problems Abroad Are Far More Disturbing." *The New York Times*, October 29. <https://www.nytimes.com/2017/10/29/business/facebook-misinformation-abroad.html>.

Rumbul, Rebecca. 2015. *Who Benefits from Civic Technology? Demographic and Public Attitudes Research into the Users of Civic Technologies*. London: mySociety. <https://www.mysociety.org/files/2015/10/demographics-report.pdf>.

Scott, Anna. 2016. "Case Study: Burkina Faso's Open Elections." London: Open Data Institute; <https://theodi.org/case-study-burkina-fasos-open-elections>.

Smith, Matthew L., and Sujaya Neupane. 2018. "Artificial Intelligence and Human Development: Toward a Research Agenda." Ottawa: IDRC. <https://www.idrc.ca/en/book/open-development-networked-innovations-international-development>.

Smith, Matthew L., and Katherine M. A. Reilly, eds. 2013. *Open Development: Networked Innovations in International Development*. Cambridge, MA/Ottawa: MIT Press/IDRC. <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/52348/IDL-52348.pdf?sequence=1&isAllowed=y>.

Snijder, R. 2013. "Do Developing Countries Profit from Free Books? Discovery and Online Usage in Developed and Developing Countries Compared." *Journal of Electronic Publishing* 16(1). <https://quod.lib.umich.edu/j/jep/3336451.0016.103?view=text;rgn=main>.

Talhouk, Salma N., Rima Baalbaki, Serine Haydar, Wassim Kays, Sammy Kayed, Mahmoud Al-Hindi, and Najat A. Saliba. 2019. "Contextualizing Openness: A Case Study in Water Quality Testing in Lebanon." In *Contextualizing Openness: Situating Open Science*, ed. Leslie Chan, Angela Okune, Rebecca Hillyer, Denisse Albornoz, and Alejandro Posada, 107–121. Ottawa: University of Ottawa Press/IDRC. <https://www.idrc.ca/en/book/contextualizing-openness-situating-open-science>.

Thorne, Michelle. 2009. "Openwashing," March 14. <http://michellethorne.cc/2009/03/openwashing/>.

Toyama, Kentaro. 2011. "Technology as Amplifier in International Development." In *Proceedings of the 2011 iConference: Inspiration, Integrity, and Intrepidity*. Seattle, February 8–11, 75–82. New York: ACM Press. <http://dl.acm.org/citation.cfm?id=1940772>.

United Nations Development Programme (UNDP) (ed.). 2016. *Human Development for Everyone*. New York: Author. http://hdr.undp.org/sites/default/files/2016_human_development_report.pdf.

Wang, Q., B. Chen, Y. Fan, and G. Zhang. 2018. *MOOCs as an Alternative for Teacher Professional Development: Examining Learner Persistence in One Chinese MOOC*. Quezon City, Philippines: Foundation for Information Technology Education and Development. <http://dl4d.org/wp-content/uploads/2018/05/China-MOOC.pdf>

Zuiderwijk, Anneke, and Marijn Janssen. 2014. "The Negative Effects of Open Government Data—Investigating the Dark Side of Open Data." *Proceedings of the 15th Annual International Conference on Digital Government Research*, Aguascalientes, Mexico, June 18–21, 147–152. New York: ACM Press. <https://dl.acm.org/citation.cfm?doid=2612733.2612761>.

