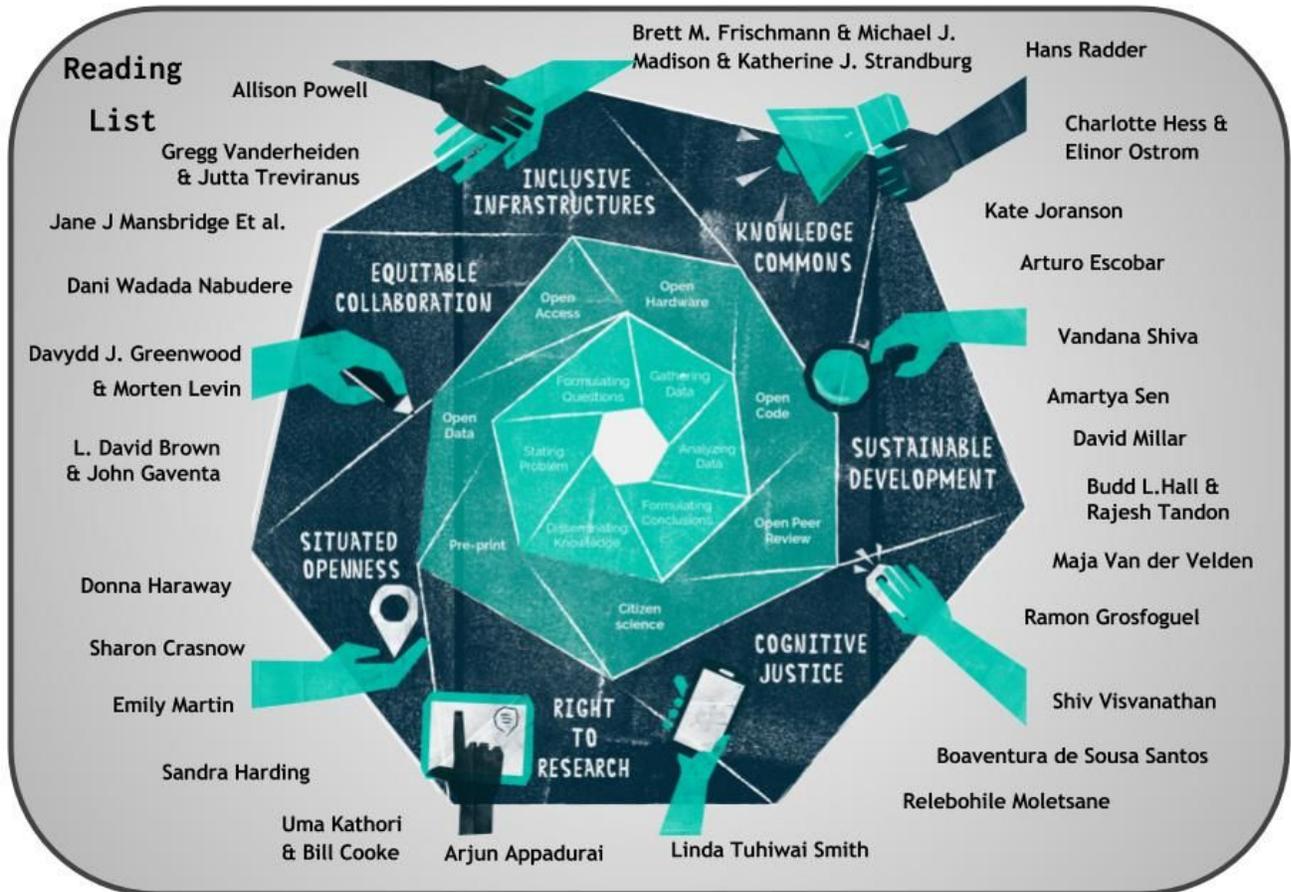


Open & Collaborative Science Manifesto

Reading List



<p>Knowledge</p>	<p>Radder, Hans eds. (2010) <i>The commodification of academic research. Science and the modern university</i>. University of Pittsburgh Press, Pittsburgh</p> <p>Linda Tuhiwai Smith. <i>Decolonizing Methodologies: Research and Indigenous Peoples</i>, 2nd Edition. London and New York: Zed Books, 2012. 240 pp. Reviewed by Tiffany Cain, University of Pennsylvania</p> <p>Hall, B.L. and Tandon, R. (2017) “Decolonization of knowledge, epistemicide, participatory research and higher education”. <i>Research for All</i>, 1 (1), 6-19. DOI 10.18546/RFA01.1.02</p> <p>Grosfoguel, R. (2013) ‘The structure of knowledge in Westernized universities: Epistemic racism/ sexism and the four genocides/epistemicides of the long 16th century’. <i>Human Architecture: Journal of the Sociology of Self-Knowledge</i>, 11 (1), 73–90</p> <p>Relebohile Moletsane (2015) <i>Whose Knowledge is it? Towards reordering Knowledge Production and Dissemination in the Global South?</i></p>
<p>Knowledge Commons</p>	<p>Hess, Charlotte, and Elinor Ostrom. "A Framework for Analyzing the Knowledge Commons: a chapter from Understanding Knowledge as a Commons: from Theory to Practice." (2005)</p> <p>Frischmann, Brett M.; Madison, Michael J.; and Strandburg, Katherine J., "GOVERNING KNOWLEDGE COMMONS – Introduction & Chapter 1" (2014). New York University Public Law and Legal Theory Working Papers. Paper 477.</p> <p>Joranson, K. (2008). Indigenous knowledge and the knowledge commons. <i>International Information & Library Review</i>, 40(1), 64-72. doi:10.1080/10572317.2008.10762763</p>
<p>Cognitive Justice</p>	<p>Visvanathan, Shiv (1997). “A Carnival for Science: Essays on science, technology and development”. London: Oxford University Press</p> <p>Van der Velden, Maja (2009), “Design for a Common World: On Ethical agency and cognitive justice”. Retrieved January 7, 2011. In <i>Ethics and Information Technology</i>, vol. 11, no. 1, pp. 37 - 47</p> <p>Reilly, Katherine (2011). "Designing research for the emerging field of open development." <i>Information Technologies & International Development</i> 7.1. 47+. <i>Academic OneFile</i>. Web. 25 Oct. 2016.</p> <p>Santos, B. D. (2016). <i>Epistemologies of the South justice against epistemicide</i>. London: Routledge, Taylor & Francis Group.</p>
<p>Situated Science</p>	<p>Haraway, Donna. "Situated knowledges: The science question in feminism and the privilege of partial perspective." <i>Feminist studies</i> 14.3 (1988): 575-599</p> <p>Harding, Sandra. <i>Objectivity and diversity: Another logic of scientific research</i>. University of Chicago Press, 2015.</p> <p>Martin, Emily. 1998. “Anthropology and the Cultural Study of Science.” <i>Science, Technology, & Human Values</i> 23 (1): 24–44.</p>

	<p>Crasnow, S. (2006). Feminist philosophy of science: 'standpoint' and knowledge. <i>Science & Education</i>, 17(10), 1089-1110. doi:10.1007/s11191-006-9069-z</p>
Rights to Research	<p>Appadurai, Arjun. "The right to research." <i>Globalisation, societies and education</i> 4.2 (2006): 167-177.</p> <p>Uma Kathori, Bill Cooke (2001) Participation: the New Tyranny?</p>
Equitable Collaboration	<p>Varieties of Human Inquiry: Collaborative, Action, Self-reflective and Cooperative. In: Greenwood D. J. and Levin, M. (2007) Chapter 14 of <i>Introduction to Action Research, 2nd Edition: Social Research for Social Change</i>. London, Sage, chapter 14, pp 208-222</p> <p>Brown, D. & Gaventa, J. (2008). Constructing transnational action research networks: Observations and reflections from the case of the Citizenship DRC. Working Paper 302, Institute of Development Studies</p> <p>Chan, L., Okune, A., & Sambuli, N. (2015). What is open and collaborative science and what roles could it play in development? In <i>Open Science Open Issues</i> . doi:ISBN 978-85-7013-110-2</p> <p>Horner, Lindsey, K. 2016. Co-constructing Research: A Critical Literature Review. AHRC. Available online</p>
Inclusive Infrastructure	<p>Powell, Alison (2012) Democratizing production through open source knowledge: from open software to open hardware. Media, Culture & Society, 34 (6). pp. 691-708. ISSN 0163-4437</p> <p>Kera, D. (2012). Open Source Hardware for open science in the Global South Geek Diplomacy. Pg 133</p> <p>Mansbridge, Jane J., Bohman, James, Chambers, Simone, Christiano, Thomas, Fung, Archon, Parkinson, John R., Thompson, Dennis F. and Warren, Mark (2012) A systemic approach to deliberative democracy.</p> <p>Brown, S., Clement, T., Mandell, L., Verhoeven, D., Wernimont, J. (2016). Creating Feminist Infrastructure in the Digital Humanities. In <i>Digital Humanities 2016: Conference Abstracts</i>. Jagiellonian University & Pedagogical University, Kraków, pp. 47-50.</p> <p>Edwards PN (2002) Infrastructure and modernity: scales of force, time, and social organization in</p>
Sustainable Development	<p>Sen, Amartya. "Development as capability expansion." <i>Readings in human development</i> (2003): 3-16.</p> <p>Shiva, Vandana. (2007). Democratizing Biology: Reinventing Biology from a Feminist, Ecological and Third World Perspective. author, Paradigm Publishers</p> <p>Escobar, Arturo. <i>Encountering Development: The Making and Unmaking of the Third World</i>. Princeton, N.J: Princeton University Press, 1995. Print.</p> <p>Millar, D. (2014). Endogenous development: some issues of concern. <i>Development in Practice</i>, 24(5-6), 637-647. doi:10.1080/09614524.2014.938615</p>

About the Reading List

The reading list stems from a collaborative long-term effort by OCSDnet to conceptualize via principles the essence of Open Science and development. The eight principles are a result of an iterative process of dialogue between the network's 12 teams and people from 26 different countries. Rather than generalizing or defining the field of open science (as it would be counterproductive), the purpose was to encounter some common principles that enable spaces in which a diversity of understandings regarding the pillars and the limitations of open science can coexist and collaborate. As such, this reading list looks to bring in the interdisciplinary academic literature surrounding the principles that were arrived at. This is by no means a finished product and we encourage your participation and input in terms of additional literature, ideas, and concepts that should be a part of this reading list.

Knowledge

A resource that belongs to and affects all members of society. "All ideas, information, data and understandings gained through experience and study, including indigenous, scientific, scholarly knowledge, as well as creative and artistic expressions". The use of knowledge by one individual does not exclude or reduce the availability for the rest.

Radder, Hans eds. (2010) *The commodification of academic research. Science and the modern university.* University of Pittsburgh Press, Pittsburgh

In this initial chapter of *The Commodification of Academic Research*, Radder provides a conceptual map of this field by looking at the process of commodification within scientific research. He lays out major mechanism, relevant empirical literature, surrounding paradigms and proposed solutions. The chapter responds to seven major questions including; understandings of commodification, how it can be assessed, understandings of its relevance, possible regulations, and alternatives. The chapter aims to present the bases for the process of commodification as a way to foment further philosophical research in the area. It is emphasized that existing research in the area has mostly focused on Western context. As a result there is a need to research the relational impacts of academic research commodification in the global south. Since knowledge is a resource that belongs to and affects all members of society understanding the mechanisms through which it is being commodified is an intrinsic part of designing alternatives and promoting an open and collaborative science.

Quotes:

"Although it is true that, in our present-day "knowledge economy," the implicit or explicit identification of these purposes with economic purposes is pervasive, there is no necessity to do so. Science can be used, and still is being used, in the more general interests of the public" (p.5)

“Major decisions that affect the organization and nature of university research are taken primarily on the basis of economic criteria, at the expense of more substantive argument” (p.5)

“In this wider and more appropriate sense, academic commodification means that all kinds of scientific activities and their results are predominantly interpreted and assessed on the basis of economic criteria” (p.4)

Linda Tuhiwai Smith. *Decolonizing Methodologies: Research and Indigenous Peoples*, 2nd Edition. London and New York: Zed Books, 2012. 240 pp. Reviewed by Tiffany Cain, University of Pennsylvania

In this revised edition of *Decolonizing Methodologies* Linda Tuhiwai reinforces the need to decolonize the academy and the research process by moving past dominant Western modes of knowledge. The book is presented as a road map for indigenous researchers who are struggling to position themselves within the academy. The first part deconstructs processes of knowledge production, knowledge institutions and knowledge hierarchies. This section exposes the detrimental effect of Western domination in indigenous experience. Tuhiwai argues that the effects are represented by four major concepts; imperialism, history, writing and theory. The second part of the book provides a guide to 25 indigenous research methodologies. The purpose is to navigate the various stages of indigenous experience (survival, recovery, development and self determination) through appropriate forms of indigenous response (decolonization, healing, transformation, mobilization). The process of undertaking decolonized research is a constantly evolving learning process in which the focus is the neglected relationship between the researcher and the communities being researched. The book's tone allows the reader to critically analyze constructs of knowledge and have a better understanding of decolonized alternatives such as open and collaborative science.

Hall, B.L. and Tandon, R. (2017) “Decolonization of knowledge, epistemicide, participatory research and higher education”. *Research for All*, 1 (1), 6-19. DOI 10.18546/RFA01.1.02

This paper argues that the lack of power structure analysis within processes of knowledge sharing has been replicating colonial power relations. As such, it urges for a need to better understand how transformative change is encouraged through deeper attention to knowledge democracy. Knowledge democracy is understood as the linkage between values of justice, fairness, and action in the process of using knowledge. The paper uses storytelling to talk about the history of epistemicide, linguicide and cultural genocide as well as the complicity of Western modern education in such processes. It also presents various ongoing processes of decolonization and promotion of cognitive justice. Such examples include processes of decolonization of established universities, the emergence of new higher education narratives and the creation of alternative universities and social movement partnership. The authors champion the emergence of community-university engagements and community-based research as cornerstone to the rise of a knowledge democracy movement. The concept of knowledge democracy overlaps with an open and collaborative science understanding of knowledge. The decolonization process presented in this paper are also process of movements to more open and collaborative environments.

Quotes:

"They illustrate how Western knowledge has been engaged in epistemicide or the killing of other knowledge systems." (p.6)

"suggest that higher education institutions today are working with a very small part of the extensive and diverse knowledge systems in the world" (p.6)

"the global North, it is forgotten that participatory research came most powerful from the indigenous communities, from women working against violence and injection drug users, all doing their own research." (p.7)

Grosfoguel, R. (2013) 'The structure of knowledge in Westernized universities: Epistemic racism/ sexism and the four genocides/epistemicides of the long 16th century'. *Human Architecture: Journal of the Sociology of Self-Knowledge*, 11 (1), 73–90. Online. <http://scholarworks.umb.edu/humanarchitecture/vol11/iss1/8/> (accessed 29 October 2016).

Inspired by Duseil's critique of Cartesian philosophy and his work on the conquest of the Americas, this paper looks to contextualize the creation of colonial structures of knowledge and the resulting epistemic racism/sexism which is foundational to the knowledge structures of the Westernized Universities. The argument looks at the existing monopoly of knowledge production in the social science and humanities by a few men from five western countries (Italy, France, England, Germany and the USA). The author refers to four genocides/epistemicides along the 16th century to explain how such concentration of knowledge production disguised under a discourse of "universality" came to be. The four historical events referred to are; (1) the conquest of Al-Andalus and the expulsion of Muslims and Jews from Europe, (2) the conquest of indigenous peoples of the Americas started by the Spanish, the French and the English, (3) the creation of a slave trade that resulted in the enslavement in the Americas, and (4) the killing of millions of Indo-European women accused of witchcraft. These processes created racial/patriarchal power and epistemic structures at a global scale. Entangled with processes of global capitalism this resulted in the normalization and internalization of such structures by westernized universities. The story of the West's epistemic privilege is rooted on a history of dispossession and epistemic inferiority; Understanding this is cornerstone to supporting the process of open and collaborative science.

Quotes:

"How is it possible that the canon of thought in all the disciplines of social science and humanities in the Westernized University is based on the knowledge produced by a few men of five countries (Italy, France, England, Germany and the USA). How is it possible that men from these five countries achieve such an epistemic privilege to the point that their knowledge today is considered superior over the knowledge of the rest of the world? How did they come to monopolize authority of knowledge in the world?" (p.74)

"The other side of the epistemic privilege is epistemic inferiority" (p.74)

Moletsane, R. (2015). Whose Knowledge is It? Towards Reordering Knowledge Production and Dissemination in the Global South. Educational Research for Social Change (ERSC), 4(2), 35-47

With South Africa as a case study, this paper takes a closer look at unequal power dynamics within the current academic publishing industry and its ineffectiveness at addressing the issues that its publications delve with specifically in the South African context. Whilst contextualizing this unequal landscape and situating herself, Molestone asks an essential question: What strategies might we as social science scholars in the Global South use to interrogate, challenge and transform the unequal power dynamics inherent within academic publishing? Answering the question requires an understanding of the academic power that social science researchers as the outside experts hold in many instances over the communities and people that they are researching. The paper thus argues that while critical theory can be useful in explicating the unequal landscape only when the research process is co-created, co-analyzed and co-communicated can there be a space for questioning and transforming the academic publishing landscape. The paper presents generative theory, creations of safe research spaces, changing the language of interaction as pragmatic tools and epistemological approaches to fomenting open research landscapes where participants can challenge and transform the entire research process.

Quotes:

"This means that members of communities must be able to meaningfully participate in all activities meant to achieve this. For Moletsane (2014), this involved thinking outside our taken-for-granted realities and understandings and instead using the actual insights of local community members to radically transform the nature of our research, the methods we use to collect and analyse it, and throughout this process, co-creating and co-analysing our findings with our participants." (p. 45)

Knowledge Commons

A knowledge commons is established when intellectual and cultural resources are collectively managed, shared, used and governed by all or most members of a community.

Hess, Charlotte, and Elinor Ostrom. "A Framework for Analyzing the Knowledge Commons: a chapter from Understanding Knowledge as a Commons: from Theory to Practice." (2005)

Ostrom and Hess explicate how an Institutional Analysis and Development Framework can be used to analyse the knowledge commons. The framework is praised for its fluidity and dynamism as it consists of a set of criteria to keep in mind when researching behaviours. The adaptability potential of the framework is well suited for study of areas where new technologies and contexts are rapidly evolving such as the knowledge commons. The framework requires a systematic look at resource characteristics, action arenas, patterns of interactions and evaluation criteria to understand their interconnectedness in affecting outcomes. The application of the framework to understanding the knowledge commons demonstrate that the sustainability and success of outcomes are dependant on the ability of institutional

characteristics, actions areas, and patterns of behaviour to adapt to rapidly changing physical characteristics. In OCSDnet the IAD framework was used to highlight enabling institutional environments and begin to address policy challenges in the various contexts. The goal was not simply to document, but also to critically examine the embedded assumptions behind various models of open collaboration. One key assumption is that OCS is a complex socio-technological system and not simply a collection of mechanisms. Attention was given to unintended outcomes and potentially negative impacts brought about by open practices and network designs.

Quotes:

“The complex nature of knowledge as a commons requires a threefold distinction because it is made up of both nonhuman and human materials: facilities, artifacts , and ideas.” (p.47)

“The most notable characteristic of an idea is that it is a pure public good and, therefore, nonrivalrous. One person’s use of it does not subtract from another’s.” (p. 48)

“For the purpose of analysis, it is important to remember that all knowledge and all technologies are human artifacts, with agreements and rules, and strongly tied to the rules of language itself. Thus, knowledge has an important cultural component as well as intellectual, economic, and political functions.” (p.53)

“The rules connected with knowledge, epistemic communities, and information technologies must continually be adapted as those technologies and communities change and grow. Rules need to be flexible and adaptable in order to create effective institutional design and ensure resource Sustainability.” (p. 53)

“Valuable scholarly and scientific information that can be harvested through its metadata will greatly facilitate the global knowledge exchange and further the timeworn tradition of open science.” (p. 55)

Frischmann, Brett M.; Madison, Michael J.; and Strandburg, Katherine J., "GOVERNING KNOWLEDGE COMMONS – Introduction & Chapter 1" (2014). New York University Public Law and Legal Theory Working Papers. Paper 477

This first chapter from "Governing Knowledge Commons" delineates the purpose as well as a guide to using a knowledge common framework that is present throughout the book. This framework builds upon Ostrom's work on an IAD approach. The framework includes a systemic approach to case study design and analysis. As such, the remaining book chapters consist of clearly selected and arranged knowledge commons case studies. The purpose is that by comparing and aggregating case studies in a productive way it should be possible to detect the structural similarities and differences between knowledge commons in different domains while explicating the contextual reasons for such discrepancies. Such situated but generalized results can be used to theorize about the emergence, stability, diversity and forms of knowledge commons. The idea being that this can eventually be useful for designing models to explicate and inform institutional design for the knowledge commons. The case studies present in the chapters cover a variety of knowledge commons domains including the creation and sharing of; scientific data, open source hardware, online knowledge resources, congressional legislations and information used by derby participants. The process of systematic case study design and analysis to create generalized but situated findings has also been used by OCSDnet in an effort to critically understand the role of open and collaborative science in development.

Joranson, K. (2008). Indigenous knowledge and the knowledge commons. *International Information & Library Review*, 40(1), 64-72. doi:10.1080/10572317.2008.10762763

This paper examines indigenous knowledge (IK) frameworks in the global context of the knowledge commons, bringing to light the intricacies of their relationships with one another. In highlighting the importance of language, the paper brings out a critique of the ironic discourses that have been surrounding the conceptualization of both Knowledge Commons and IK. The knowledge commons has been primordially defined under the metaphoric language of an ecosystem. However, ecosystems represent rivalrous commons which is directly contradictory to the non-rivalrous nature of the knowledge commons. Similarly, the importance of IK has been conceptualized under market-driven discourses that urge the need of identifying, documenting, collecting, and systematizing it to exploit/"protect" the value that it holds for scientific knowledge and its usefulness in pursuing development. The author emphasizes that such discourses are not cycles in which IK or KC naturally exist but rather imposed and created frameworks in most instances representative of traditional western-centric views. As such, Joranson urges the need to explore new language to describe the knowledge commons and its relationships with other frameworks such as that of IK. Similarities are found in the emergence and proliferation of an Open Science agenda through the co-option of a market-driven knowledge-economy discourse. The OCSDnet manifesto and principles are in part an attempt to critically explore new language to describe the field of open and collaborative science.

Quotes:

“Defining knowledge as a commons is key to examining the language of IK discourse and practice.” (p. 65)

"This language of the commons is powerful not only in the communication a community level context but also in providing a voice for individuals. It allows an individual to imagine himself or herself as one who generates ideas rather than one who merely consumes them" (p. 66)

"By looking at the process of defining IK, we learn that IK does not fit neatly into the more compartmentalized ways of understanding it. IK does however, seem to situate itself in the knowledge commons." (p. 67)

Cognitive Justice

This ideal considers that all individuals and communities, regardless of their culture, gender, socioeconomic status or language, should be able to fully exploit their capabilities to use, share and create knowledge. It recognizes the plurality of global knowledge and fosters the interaction of diverse scientific traditions.

Visvanathan, Shiv (1997). “A Carnival for Science: Essays on science, technology and development”. London: Oxford University Press

Visvanathan is a renown Indian academic who originally coined the term cognitive justice in his book “*A Carnival for Science: Essays on science, technology and development*”. The book, a collection

of essays by Visvanathan, is centered in the Indian postcolonial experience and is about the complex relationship between science, society and development. It exposes a western hegemonic dominance of science and the negative impacts of such for various populations in the Global South. Cognitive justice is presented as a move to acknowledge the existence of a pluralism of knowledge systems and scientific understandings. Since knowledge systems are situated within a given context and a lived reality there should be an equality of treatment for each. Cognitive justice also encompasses the ability for a plurality of knowledge systems to coexist and collaborate. Visvanathan presents examples of the connectedness of science and political decisions in the Indian context in order to showcase how reforming science contributes to processes of revamping democracy. Cognitive justice is an intrinsic part of open and collaborative science as there is also a plurality knowledge around diverse understandings of openness and collaboration.

Van der Velden, Maja (2009), "Design for a Common World: On Ethical agency and cognitive justice". Retrieved January 7, 2011. In *Ethics and Information Technology*, vol. 11, no. 1, pp. 37 - 47

Van der Velden utilizes a feminist technoscience approach as she engages within a discussion on addressing the harmful effects of technology. She argues that the prevailing ethical paradigm locates agency in the individual user alone. However, through her experience with information and communication technologies in developing countries the author argues that such an individualist approach fails to represent the implications of interactions of a diversity of human knowledges. Through a technoscience approach the paper proposes a move away from an individualist understanding of technological agency to one in which agency is "enacted and performed in socio-material configurations of people and technology and their intra-actions". It is argued that such an understanding opens a space for a restructuring the design processes in technological development as one that acknowledges and promotes cognitive justice. This paper depicts an example of how the concept of cognitive justice is being used in a variety research sectors to promote and acknowledge the coexistence of an existing plurality of human knowledges.

Reilly, Katherine. "Designing research for the emerging field of open development." *Information Technologies & International Development* 7.1 (2011): 47+. *Academic OneFile*. Web. 25 Oct. 2016.

This paper provides a cognitive justice geared research framework for the area of open development. The author argues that research frameworks in this area continue to have traditional assumptions of technological appropriation and empowerment through a focus on productivity. The framework proposed consists of a "constructivist and critical realist epistemology, through positional methodology and through networked research processes" (p.47). The idea is to move beyond the blind promotion of ICT4D (ICT for development) and its assumed benefits and rather to engage critically in understanding its implications in the promotion of cognitive justice. The paper argues that the significance of this research framework lays in the intersection of ontological foundations and policy decisions with direct implications to development. As such, it is imperative that the field of ICT4D which is usually situated at the practical end of the spectrum engages in theoretical and critical analysis of its own ontological priors and epistemological commitments. Incorporating the concept of cognitive justice into research frameworks within fields of open science and development implies a critical rethinking of its

implications and the discourses under which it is being proposed.

Quotes:

“producing better understanding of cognitive justice in developing countries will help both researchers and knowledge producers to better understand the problem of generating spaces in which there is respect for communications rights, democratized knowledge production, and open communication” (p.56)

Situated Science

A concept that assumes knowledge is situated within particular historical, political and socio-cultural relations. It addresses inequalities and hierarchies of knowledge production and its inherent conflicts.

Haraway, Donna. "Situated knowledges: The science question in feminism and the privilege of partial perspective." *Feminist studies* 14.3 (1988): 575-599

Haraway challenges traditional understandings of knowledge as she exposes the privilege involved in the notion of objectivity. The paper challenges scientific objectivity as a privilege historically given to unmarked bodies, referring to patriarchal, eurocentric and bourgeois mindsets. Haraway proposes situated knowledge as a way to address the inherent paradox of knowledge objectivity. Situated knowledge refers to knowledge situated within a context whether it be historical, political, socio-cultural or intellectual. The argument is that even though situated knowledge provides a narrower more focalized scope of vision it is richer than disembodied knowledge in that its information is understood through the environment and context in which it was constructed. The narrower scope of situated knowledge also encourages conversation and collaboration between traditionally silenced voices in knowledge production as richness is correlated with diversity of standpoints on a particular topic. This has been true at OCSDnet where the various teams have reflected on the ways in which the various contexts they belong to affect differently the way in which each relates to and understands concepts of openness in science.

Quotes:

“I am arguing for politics and epistemologies of location, positioning, and situating, where partiality and not universality is the condition of being heard to make rational knowledge claims. These are claims on people's lives. I am arguing for the view from a body, always a complex, contradictory, structuring, and structured body, versus the view from above, from nowhere, from simplicity. Only the god trick is forbidden. (p. 589)”

Harding, Sandra. *Objectivity and diversity: Another logic of scientific research*. University of Chicago Press, 2015.

Harding is a founder of feminist epistemology, she has been a prominent writer on standpoint theory and strong objectivity. In this recent book, she revisits the contentious relationship between objectivity and diversity in science and argues that the two can be mutually supportive. The book deconstructs the history of objectivity showing how it has always been political and dominated by a

Western centric view of science. The critique of indigenous knowledge systems through Western constructs of objectivity is highly ironic given the amount of cases of acquisition and accumulation of indigenous knowledge in the development of Western science (fx: indigenous botany in health sector). The book argues that the process of achieving objectivity through the active marginalization of a diversity of knowledges ends up weakening the objectivity within the scientific process. Through examples of development policy and postcolonial science the book argues that a pluralism of knowers and methodologies is the blueprint for a strong objectivity.

Martin, Emily. 1998. "Anthropology and the Cultural Study of Science." *Science, Technology, & Human Values* 23 (1): 24–44.

Martin explores ways in which anthropological understandings of culture can provide unique reflections into the workings of science in its situated context. The movement away from a homogenous understanding of culture in anthropology can permeate in understandings of science. This can be done by paying attention to domains outside the traditional laboratory and exploring the complex interactions between scientist and nonscientists as they actively engage with scientific knowledge in heterogeneous spaces of culture. Martin questions the idea that science claims to construct reality but not to be itself constructed. Her argument is built upon three analogies; the citadel, rhizomes, and string figures. The citadel symbolizes modern science bringing light to its construction as well as that of its exclusionary boundaries. Ethnographic works shows that actions within the science citadel occur and are influenced in a complex relationships between the "non scientist" general outside the citadel as well as powerful groups around the landscape of the citadel. So what appears to be fixed one-directional borders are actually porous convoluted and leaky walls of the citadel. What grows inside the citadel as well as what grows within it are part of complex and discontinuous system of linkages and actions resembling the root system of a rhizome. This lens Martin argues creates a picture of "natural and medical sciences as complex, in constant, turbulent interaction with many parts of the cultural landscape". She urges for a view of science as a loosely bounded conglomerate of practices promoting a diversity in scientific understandings and their relationship with the "non scientist" world. The interactions that Martin presents have been present in the case studies at OCSDnet where the promotion of a "citizen science" has been constant yet conceptualized differently under the various contexts present.

Quotes:

"What if many kinds of processes proceeding from fundamentally different assumptions about the world profoundly affect experts and scientist even as they accumulate resources and build networks?" (p.28)

"What if instead people who call themselves scientist are continuously interacting with and being profoundly affected by, people who do not call themselves scientist? What if, in complex historical circumstances, both scientists and nonscientists are forging ways of acting, being, and thinking in the world, or in other words, forging what anthropologist call culture?" (p.28)

"...an anthropological approach would press for a much more inclusive notion of what counts as pertinent to the objects of scientific knowledge and practice. Instead of allowing the particular interests of the scientists to determine which persons, settings, and materials are relevant, one could grant nonscientists

coming from many different cultural settings the ability to alter the agendas of scientific research or the uses of scientific materials. Exploration of this issue has been begun by anthropologists like Rayna Rapp and Deborah Heath.” (p.29)

Crasnow, S. (2006). Feminist philosophy of science: ‘standpoint’ and knowledge. *Science & Education*, 17(10), 1089-1110. doi:10.1007/s11191-006-9069-z

Crasnow revisits standpoint theory as a response to major criticisms on the lack of objectivity within the field of feminist philosophy of science. She argues that Harding and Wylie theories on objectivity as well as a "model-based approach" clearly exemplify the ways in which standpoint as part of a feminist epistemology provides a better understanding of scientific knowledge. Proving the methodological value of standpoint theory in increasing objectivity requires a reconceptualization of objectivity as one that acknowledges the role of social values in the practice of good science. Harding concept of "strong objectivity" is a negotiation of a modernist/post-modernist divide as a response to a common critique of standpoint theory as objectivist and relativist. Wiley takes a more traditional approach as she defines objectivity as a set of epistemic virtues such as empirical adequacy. She argues that standpoint theory "enables judgments about which epistemic virtues are to be maximized in particular circumstances in order to achieve the goals that are relevant to those circumstances." This process of achieving epistemic standpoint privilege can reveal unique insights that would otherwise go unnoticed. Crasnow adds to these accounts by proposing a model-based objectivity, urging us to think of science in terms of models. She explains that models are mediators between theory and the world and as such in the process of constructing them we focus on the features that we believe are most relevant. The model that a standpoint methodology promotes is one of the social worlds in which features that contribute to maintaining the power relations that keep certain communities marginalized are made explicit. Incentivising the production of knowledge that will allow such communities "to negotiate their way through and ultimately transform those power relations". Overall, the three accounts prove the importance of a feminist philosophy for science and further exploration of questions of science and values.

Quote:

"Feminist epistemology in one of the groups of approaches in science studies that urges us to recognize the role of the social in the production of knowledge" (p.20)

"Model-based objectivity turns the problem of science and values on its head. Instead of asking how science can manage to be objective even though values play an intrinsic role in knowledge production, I am claiming that science values do play a role, we should be asking questions about the objectivity of value claims...The question is not how science can be objective if values enter, but rather which values are the ones that will give us objectivity in this sense". (p.18)

"Standpoint enables judgments about which epistemic virtues are to be maximized in particular circumstances in order to achieve the goals that are relevant to those circumstances." (p.11)

"Epistemic privilege does not come from viewing things from the perspective of those in subordinate positions, but rather from that perspective together with awareness of social, political and other factors that maintain the status quo" (p.6)

"Feminist philosophy of science has come to be constructed more broadly as one means of providing insight into the nature of scientific knowledge, primarily through considering the role social values play in scientific knowledge . in doing so feminist suggest alternatives to traditional conceptions of objectivity, both by redescribing the objectivity of science and by offering normative recommendations." (p.3)

Right to Research

The right of individuals to participate at all stages of the research process as a means to gain strategic knowledge about their communities and fulfill their capabilities.

Appadurai, Arjun. "The right to research." *Globalisation, societies and education* 4.2 (2006): 167-177.

Appadurai, challenges dominant conceptions of research by arguing through a rights- based scope that research is an inherent right to all humans. He argues that humans should be claiming access to the avenues through which they can make systematic and disciplined inquiries about those issues most relevant to their survival and their ability to make claims as citizens. The argument is organized around three ideas. The first is acknowledging the existing paradox and element of mystery within research as we try to systematically understand something we do not know and that might be in of itself unsystematic. The second is understanding that the process of globalization has forced global south states to open up their educational markets exacerbating global inequalities in “the rights to research”. The exacerbation occurs through the rise of vocational credentials offered by western-centered institutions in in which research is not a priority and in which the focus is towards capital intensive industries. The final argument is based on his own effort to promote right to research in Mumbai and the realization that such promotion directly influences an essential capacity for democratic citizenship.

Quotes:

“The capacity to do research, in this broad sense, is also tied to what I have recently called ‘the capacity to aspire’ (Appadurai, 2004), the social and cultural capacity to plan, hope, desire, and achieve socially valuable goals. The uneven distribution of this capacity is both a symptom and a measure of poverty, and it is a form of maldistribution that can be changed by policy and politics. In the current context, I can only suggest that the capacity to aspire and the right to research are necessarily and intimately connected.” (p. 176)

“Thus, asserting the relevance of the right to research, as a human right, is not a metaphor. It is an argument for how we might revive an old idea, namely, that taking part in democratic society requires one to be informed.” (p.177)

“In a word, while knowledge of the world is increasingly important for everybody (from tourist guides to pharmaceutical researchers), the opportunities for gaining such knowledge are shrinking.”(p.176)

“The world in which we live is characterised by a growing gap between the globalisation of knowledge and the knowledge of globalisation.” (p.175)

Equitable Collaboration

Equitable, horizontal interaction and collaboration between formal and informal knowledge communities. We emphasize collaboration and co-creation as means for community devised solutions and social innovation.

Varieties of Human Inquiry: Collaborative, Action, Self-reflective and Cooperative.’ In: Greenwood D. J. and Levin, M. (2007) Chapter 14 of Introduction to Action Research, 2nd Edition: Social Research for Social Change, London, Sage, chapter 14, pp 208-222

This chapter in the 2nd Edition of "Introduction of Action Research" examines a group of multidisciplinary approaches to the process of human inquiry. The chapter is centered around the prolific work of Peter Reason in the field. However, it also serves well as a literature review of evolving approaches to AR as it discusses commonalities and differences between collaborative, action, self-reflective and cooperative inquiry as proposed by a variety of authors such as William Torbert, Judi Marshall, and Hilary Bradbury. Such approaches and principles of action research are clearly aligned to the principle of equitable collaboration in open science through concepts such as cooperative inquiries and by moving away from research “on” to research “with” people acknowledging and embracing pluralities of knowledges. The chapter emphasizes what has been a healthy move away from third-person forms of inquiry bringing in much-needed discussion around issues of positionality and interpersonal dynamics through first and second person forms of inquiry. The piece finishes with a critical discussion on the question of validity for AR under the premise that good and ethical methods are not sufficient to produce good quality inquiry.

Quotes:

"AR centers on producing knowledge that is useful to people in everyday life, that increases the well-being of individuals and communities in the context of sustainable relationships with the rest of the world, that is emancipatory in intent and that centers on dynamic, ongoing inquiry processes." (p. 3)

"Reason has developed a comprehensive overview of what they call "cooperative inquiry" which means research "with" instead of "on" the people... it requires that all participants be involved as co-researchers in all dimensions of the research process" (p.3)

Brown, D. & Gaventa, J. (2008). Constructing transnational action research networks: Observations and reflections from the case of the Citizenship DRC. Working Paper 302, Institute of Development Studies.

The paper looks critically at the complexity of constructing transnational action research networks which are permeated by local and global contexts of resources and power inequalities as well as a diversity of knowledge systems and cultures. The reflections and analysis are based on an "insider-outsider" look at 5 years of the experience for the DRC Citizenship, Participation and Accountability Network. The "insider-outsider" methodology allowed for an in-depth but also critical balance to bias and involvement. The paper brings to light the importance as well as the challenges of equitable collaboration as a key pillar of transnational action research networks. It emphasises their unique position to effectively bridge axes between local and global, North and South and practice and theory divides. The case looked at the significance of articulating shared values and purposes, the development of relationships and trust, the creation of appropriate network architecture, and the distribution of power. This analysis demonstrates how the nature of transnational action research networks is allowing them to produce creative results that would not emerge from another context. As a translational action research networks OCDSnet has delved into such complex relationships. The work around a common manifesto and principles has been cornerstone to negotiating power divides while articulating shared values and purposes.

Quotes:

"Transnationals are often perceived to be dominated by affluent Northern researchers with access to donors and transnational policymakers, but empowering Southern participants can be critical to making use of their special perspective and access to realities on the ground" (p.9)

"In a world of increasing global interdependence, expanding problems of governance and citizenship, and escalating need for developing new knowledge policies and practices, we are convinced that transnational networks offer an important area for the strengthening of the role of action research in development" (p.28)

Chan, L., Okune, A., & Sambuli, N. (2015). What is open and collaborative science and what roles could it play in development? In *Open Science Open Issues* . doi:ISBN 978-85-7013-110-2

This paper lays out the rationale and presents the blueprint of an open and collaborative science research network. In doing so it is trying to produce a critical understanding of the relationship between the emerging open science initiative and development outcomes. The rationale for the network is presented by outlining the emergence of the following fields/concepts: "openness", "open development", "open science" and "open science and development". The research network looks to fill in an existing gap as seen through the limited empirical evidence to understand the claims being made by open and collaborative science. The network adds an innovative equitable collaboration scope to its framework in an effort to promote the active participation of historically marginalized Global South researchers throughout the entire knowledge production process.

Quotes:

"Collaboration entails equitable contribution in both the framing and the search for solutions to relevant problems, and not simply about following the norms set by those in power or in charge of resources" (p.97)

"Openness is not simply about gaining access to knowledge but also about the right to participate in the knowledge production process, driven by issues that are of local relevance, rather than research agendas set elsewhere or from the top down." (p.97)

Horner, Lindsey, K. 2016. Co-constructing Research: A Critical Literature Review. AHRC.
Available online:
<https://connected-communities.org/wp-content/uploads/2016/04/16019-Co-constructing-Research-Lit-Review-dev-06.pdf>

This critical literature review presents an overview of different practical and theoretical approaches to doing "co-constructed research". The review was constructed with the purpose of creating a common baseline of shared learning for a set group of projects and as such it does not claim to be defining the field or its barriers. The researchers define co-construction as a process occurring throughout the entire research process including a commitment to involve community participants in identifying areas of research, shaping research questions, research design, data collection, data analysis and writing up, dissemination and beyond . As such, co-constructions moves beyond traditional research participation approaches which only saw the involvement of communities in data gathering or as informants. The main theoretical framework that the literature engages with include pragmatism, critical theory (decolonizing theory,) and poststructural theory (postcolonial theory, standpoint feminism). Through those, the review takes a closer look at issues of participation, transformation, and a commitment to unite theory and practice within the literature on co-construction of research. A set of alternative and creative methods are also included within the review as a complementary part of what co-construction represents.

Quotes:

"Co-constructed research is research in which community organizations, groups, and individuals are involved not only in gathering data or acting as informants but in developing alongside researchers that aims and designs of research activities."

"Co-constructed research is not a single coherent framework or research method, but instead describes a research approach which seeks to redress the power imbalances between researchers and communities, knowledge and power. In other words there is more to co-construction than methods." (p.8)

"The emphasis on equal partnership and participation in the production of knowledge is also indicative of an underpinning democratic value found in co-constructed research, which seeks the pursuit of human progress through participation" (p.9)

Definition: Co-construction will be defined as research that focuses on the co-construction of the research process and not simply the involvement or consultation of users/publics. I am using co-construction as a synonym for research involving co-creation, co-production, and co-design. (p.6)

Inclusive Infrastructures

Tools that integrate the diverse contexts and needs of all stakeholders in their design. Inclusive infrastructures promote greater interaction between data providers and data users, and enable all the actors to produce, gather, share, collaborate and use scientific knowledge.

Powell, Alison (2012) Democratizing production through open source knowledge: from open software to open hardware. *Media, Culture & Society*, 34 (6). pp. 691-708. ISSN 0163-4437

The author uses a constructivist framework to provide a critical perspective on the democratic potential of the production of open-sources software and hardware communication resources. Through a look at a case of open sourcing hardware (OHANDA) with a focus on democratization of production, governance and knowledge exchange the paper also exposes the limitations of this democratization. The paper explores the complex relationship between the various emerging open-source cultures and their embeddedness within market structures. A major conclusion is that while there is a democratization potential with the proliferation of open-source contributions the incompatibility of the various emerging communities can have a significant effect in the influence and extent of such democratization.

Quotes:

“Despite these views of open participation structures as challenging to hegemonic forms of media, tension remains between radical re-interpretations of how knowledge or culture should be produced, and the co-optation of this knowledge by institutions such as the market.” (p.5)

“This raises questions about the extent to which characteristics of 'openness' especially the commons-based production characteristic of FLOSS have disrupted or reinvigorated capitalist modes of production.” (p.6)

“As I explain in the next section, the movement of knowledge –and hence, of intellectual labour –from advocates of free software to open-source software production processes has significantly reconfigured the software production process, in part through an increased democratization, whereby contributions from a wider variety of actors destabilize neo-liberal market-based modes of assigning value, but also through entirely alternative ways of producing value.” (p.7)

Kera, D. (2012). Open Source Hardware for open science in the Global South Geek Diplomacy. Pg 133

This chapter from the book *Open Science, Open Issues* documents the convergence of DIY biology, Open Source Hardware and Open Science movements. The chapter focuses upon the critical role that open hardware has played in the formation of South to South and South to North networks. These “open science diaspora networks” are not only creating opportunities for citizen scientist but also defying North-South divisions as they bring in the voices of scientist from developing countries. The chapter speaks of the emergence of “geek diplomacy” as a movement in which people are empowered “to use and

build new tools, apps, and hardware as well as change the social and technical conditions and limits while discussing the issues that are important to them” (Kera, p.148). The empowerment of citizen scientist from the global south through this open hardware networks and collaborations is also creating a channel for such citizens to express a critical political voice through their “hacking”. This process is both material and discursive and the emergence of open hardware infrastructure is occurring through a discursive rethinking of the role of science and open science in the Global North and South.

Quotes:

“With the OSHW model for open science, we can finally question the deficit model of science communication and the whole idea of technology transfer rooted in the unreflected colonial views of the Global South as recipient of science knowledge leading to development (byerlee; fischer, 2002; forero-pineda, 2006).” (p.149)

“The emergent public of tinkers and geek diplomats view the political ideal as something we need to co-create and design rather than embody like some true nature of our soul or society.” (p.151)

Mansbridge, Jane J., Bohman, James, Chambers, Simone, Christiano, Thomas, Fung, Archon, Parkinson, John R., Thompson, Dennis F. and Warren, Mark (2012) A systemic approach to deliberative democracy. In: Parkinson, John R. and Mansbridge, Jane J., (eds.) Deliberative systems : deliberative democracy at the large scale. Theories of Institutional Design . Cambridge, UK : Cambridge University Press, pp. 1-26. ISBN 9781107025394

The reading proposed a new phase for the study of deliberation in democracies through what they call a systemic approach to deliberate democracies. This approach is rooted in the lack of empirical research on deliberate democracies that understands institutions and processes as a part of a larger system of players and interactions embedded in structures of power through time. This systemic approach to understanding "deliberate democracies" facilitates the production of inclusive tools and infrastructures which create spaces for deliberation not only around what forms of knowledge are created but also on how they are created and who is included in the creation process. This approach is thus highly relevant to knowledge production in the context of open and collaborative science. The paper looks at the notion, functions, boundaries, and defects of a deliberative system. The systemic analysis of the role of experts in deliberative democracies is particularly interesting in the context of dominant knowledge production processes in science. The reading suggest that a systemic understanding foments the production of infrastructures that connects experts with citizens and improve deliberative systems as they include diverse forms of knowledge in the deliberation process.

Quotes:

"These different ways of connecting experts with citizens can improve the deliberative system in its epistemic function by bringing in more- and more diverse- knowledge in its ethical function by reducing the lack of respect between experts and citizens, and in its democratic functions by including the perspective and interest of more citizens" (p.17)

"In democracies of any size, however, controversy arises over where and when experts are appropriate

and how expert deliberations can be connected to final policy decisions or the polity more general direction. Only a systemic approach to deliberation can make this question tractable."(p. 13)

"In what sense can we say that whole societies, demoi, peoples, or even different communities deliberate together? a systemic approach allows us to think productively and creatively about this question. It expands the scale of analysis beyond the individual site and allows us to think about deliberations that develop among and between the sites over time. " (p.2)

"We have shown how the systemic approach can serve as a framework for a wide-ranging and fruitful normative and empirical study of the democratic process and from a deliberative perspective" (p.26)

Brown, S., Clement, T., Mandell, L., Verhoeven, D., Wernimont, J. (2016). Creating Feminist Infrastructure in the Digital Humanities. In *Digital Humanities 2016: Conference Abstracts*. Jagiellonian University & Pedagogical University, Kraków, pp. 47-50.

This paper/panel focuses on the production of an ideological infrastructure that urges feminist to appropriate existing technologies and produce new material tools in the service of common ends. The paper speaks of physical, software, organizational, institutional and methodological as types of infrastructures for the context of digital humanities. Feminist thinking invites for a critical lens at the social and relational aspects of digital infrastructure and its inclusiveness potentials. The panel is comprised of a variety of experiences and papers by the panelist. Throughout the paper, a number of feminist technical infrastructures examples are presented. For example; Jacque Wernimont from FamTechNet explains how they have used a feminist theory to develop Distributed Open Collaborative Courses that recognize the complexities of the learning situations by collectively design local platforms. The course is a response to MOOC's which according to her argument replicate the power structures of knowledge production. Overall, the purpose of this panel was to understand "1) the extent to which even something as apparently neutral or apolitical as infrastructure is imbued with gender and other socio-political considerations; 2) the impact of systemic gender and racial discrimination in a range of infrastructural contexts, notwithstanding the extent to which so many DH practitioners work hard to overcome the biases embedded in our cultures and our discourses; and 3) current and prospective strategies for countering those biases".

Quotes:

"Digital humanities infrastructure can open up new visions of the world in which we live, and invite contemplation of the different ways in which we might live, and work, in it"

"In short, while scholars claim a keen desire to frame infrastructure development in the context of theories such as cultural criticism, feminist inquiry, and post-colonial critique, her investigation indicates that many training programs are not framed in these ways." (Tanya Clement)

Sustainable Development

Improving the capacity of individuals and communities to act on their own behalf and contribute to the
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well-being of their communities. Meaningful local development is culturally-sensitive, environmentally sustainable and led by communities.

Sen, Amartya. "Development as capability expansion." *Readings in human development* (2003): 3-16.

Sen proposes a change of paradigm in the traditional assessment of development, achievement and progress. The paradigm shift requires a movement away from a linear homogenous understanding and assessment of development through variables such as real income and utility. The paper argues that economic prosperity is only one of the routes of enriching people's lives. As prove there are multiple rich countries in conventional understandings in which citizens are experiencing poor quality of life. The author thus propose a capability approach in which development can be assessed on a variety of human capabilities that provide freedom to choose one kind of life over another. In this paper the author covers topics on freedom, data limitations, gender, class and inequality to further explain some of the existing complexities around the assessment of development as seen through expansion of human capabilities.

Shiva, V. (1995). *Democratizing Biology: Reinventing Biology from a Feminist, Ecological and Third World Perspective*. In *Reinventing Biology: Respect for Life and the Creation of Knowledge (Race, gender, and science)*. Bloomington [u.a.] : Indiana Univ. Press.

Shiva has been a prominent proponent and critical evaluator of sustainable development. In this chapter from *Reinventing Biology: Respect for Life and the Creation of Knowledge* the author engages critically with embedded power dynamics in the production of scientific knowledge through a political ecology, feminist, and critical development studies theoretical framework. The author emphasizes that women from the global south should to be at the forefront of a re-invention of biological thinking. Given the undemocratic paradigm of biological determinism it is argued that the process of democratizing biology must also address the recovery and dialogue of pluralism of knowledge traditions. Such a recovery promotes culturally sensitive biological thinking which strengthens the capacity of communities to act in their own behalf and contribute to the well-being of their own communities. The author also emphasizes the dire need for a innovative rethinking of a coherent theory on intellectual property rights and biosafety.

Quotes:

“A shift to a postreductionist paradigm of biology that recognizes that biological organisms are complex and that ways of knowing their properties can be plural would undermine the epistemological basis of IPRs for life forms.” (p.66)

“Democratizing biology involved recognition of the intrinsic value of all life forms and their inherent ability and right to survival independent of gender, race and species differences. It involved the recognitions of the right of all citizens in determining how we relate to diverse species. Through such a democratization we could create a science that respects all others, and includes all others.” (p.69)

“The colonization of other species, other cultures, and all societies has threatened both biological and cultural diversity. The democratization of biology offers an opportunity to undo these colonizations and to create possibilities for the flourishing of diversity in nature and in our minds.” (p.69)

Escobar, Arturo. *Encountering Development: The Making and Unmaking of the Third World*. Princeton, N.J: Princeton University Press, 1995. Print.

Escobar has been a prominent post-development thinker providing a critical perspective on avenues for change and the construction of sustainable development. In this book he deconstructs the development discourse and exposes its inherent top-down, ethnocentric and technocratic approach. His arguments is grounded in what he calls the three axes that define development which consist of forms of knowledge, regulatory power structures and subjectivity inherent in the discourse. In chapter five he focuses partly on forms of knowledge to expose contradictions and opportunities inherent within sustainable development. Escobar is critical of real changes in terms of discourse and the implications that this has on the practice. The main idea is that the reproduction of the development discourse packaged under different terminology ends up replicating the same impacts that have been analyzed throughout the book. The last chapter exposes the urgency of further research in local settings acknowledging context looking to understand hybrid and alternative social movements in the Global South. It is through such movements that the book situates a possible post development regime.

Millar, D. (2014). Endogenous development: some issues of concern. *Development in Practice*, 24(5-6), 637-647. doi:10.1080/09614524.2014.938615

This article provides a theoretical overview of the concept of endogenous development in relation to issues of poverty and globalization. The paper references a few instances of change in European institutions from exogenous to endogenous development approaches. However, the main focus is on a proposed paradigm shift from what it calls an African alternative to modernization and development through endogenous development. The case studies presented are referent to the work of two NGO in Africa and Ghana. Endogenous development is thus understood as development processes happening from within the communities based mostly although not exclusively on locally available resources, knowledge, culture, and cosmovision. The author emphasizes that such an approach also includes the openness to integrate outside knowledge and practices allowing for the coexistence of different cognitive understandings under an equitable and appropriate playing field. The article concludes by providing guidance and frameworks for enabling environments for endogenous development with a direct focus on the process of building empathetic relationships with communities.

Quotes:

Definition: "Endogenous development implies development from within that is both biophysical and socio-cultural in nature. it is based mainly, though not exclusively, on locally available resources local knowledge culture leadership, and their cosmovision with openness to integrate outside knowledge and practice" (p. 639)

"Hence, endogenous development aims at the local determination of development options: local control over the development process and the retention of the benefits of development within the local area." (p.640)