Towards a Political Ecology of Innovation: Research Advances and Challenges Ahead

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Outline

• Introduction
• Our Contemporary Conjuncture
• Innovation Literatures
• Colonialism, and the Development of Underdevelopment
• Neo-liberalism, late stage Capitalism, and Coloniality (post/neo)
• Political Ecology Studies
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Introduction

“The archaeological record of Africa provides the earliest evidence for the emergence of the complex symbolic and technological behaviours that characterise Homo sapiens” (Wilkins et al, 2021)

“[People] make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. The tradition of all dead generations weighs like a nightmare on the brains of the living” (Marx, 1852)

• Our Common Era was forged in the violence and chaos of Expropriation, Exploitation, and Epistemicide
• Our Contemporary Conjuncture continues to reproduce Combined and Uneven Characteristics albeit framed within Common Challenges and Shared Constraints
• global South/ global North Asymmetries and Inequities challenge the framing of a homogeneous Anthropocene
Our Contemporary Conjuncture: Demography & Economics

Graphics from Statistica, Our World in Data, & IMF.
Data from UN Population Division, 2022 & IMF, 2022.
Our Contemporary Conjuncture: Multidimensional Poverty

- 1.2 billion people are multidimensionally poor
- 593 million (about half) are children under age 18
- 579 million live in Sub-Saharan Africa, followed by South Asia (385 million)
- 72 out of 81 countries with trend data, covering roughly 5 billion people experienced a statistically significant reduction in absolute terms in MPI value during at least one of the periods analysed (UNDP, 2022b)
“... we die earlier, we are less well educated, our incomes are going down” (Achim Steiner, in Bottollier-Depois, 2022)
Our Contemporary Conjuncture: HDI & Vulnerability


Source: UNDP, 2022a
Early Literatures on Innovation

• “There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. For the reformer has enemies in all those who profit by the old order, and only lukewarm defenders in all those who would profit by the new order, this lukewarmness arising partly from fear of their adversaries ... and partly from the incredulity of mankind, who do not truly believe in anything new until they have had actual experience of it” (Machiavelli, 1515)

• As the births of living creatures, at first are ill-shapen so are all innovations, which are the births of time. Yet notwithstanding, as those that first bring honour into their family, are commonly more worthy than most that succeed, so the first precedent (if it be good) is seldom attained by imitation. For ill, to man’s nature, as it stands perverted, hath a natural motion, strongest in continuance; but good, as a forced motion, strongest at first. Surely every medicine is an innovation; and he that will not apply new remedies, must expect new evils; for time is the greatest innovator; and if time of course alter things to the worse, and wisdom and counsel shall not alter them to the better, what shall be the end? (Bacon, 1652)
Technological Development & Creative Destruction

• “The principle which it pursued, of resolving each process into its constituent movements, without any regard to their possible execution by the hand of man, created the new modern science of technology. The varied, apparently unconnected, and petrified forms of the industrial processes now resolved themselves into so many conscious and systematic applications of natural science to the attainment of given useful effects”

  (Marx, 1867)

• “The opening up of new markets, foreign or domestic, and the organizational development from the craft shop to such concerns as U.S. Steel illustrate the same process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism”

  (Schumpeter, 1942)
Colonialism: Science and Technology (Rodney, 1972)

• “It is common knowledge that the gap between the output of the metropoles and that of the colonies increased by at least fifteen to twenty times during the epoch of colonialism.

• More than anything else, it was the advance of scientific technique in the metropoles which was the cause of the great gulf between African and Western European levels of productivity by the end of the colonial period.

• Therefore, it is essential to understand the role of colonialism itself in bringing about the scientific progress in the metropoles, and its application to industry.

• It would be extremely simple-minded to say that colonialism in Africa or anywhere else caused Europe to develop its science and technology.

• The tendency towards technological innovation and renovation was inherent in capitalism itself, because of the drive for profits.

• However, it would be entirely accurate to say that the colonization of Africa and other parts of the world formed an indispensable link in a chain of events which made possible the technological transformation of the base of European capitalism.”
“European science met the needs of its own society, and particularly those of the bourgeoisie. The bourgeoisie did not suffer from hunger and starvation. Bourgeois science therefore did not consider those things as needs which had to be met and overcome—not even among their own workers and least of all on behalf of Africans.

This is just a specific application of the general principle that the exploitation of Africa was being used to create a greater gap between Africa and capitalist Europe.

The exploitation and the comparative disadvantage are the ingredients of underdevelopment.

In particular, the fantastic changes in science did not reach African classrooms, for there were few schools where science subjects were taught. Similarly, the evolution of higher technical education did not have any counterpart in colonial Africa.

“Science and technology derive from the effort to understand and control the natural environment. Familiarity with the history of science is essential to an awareness of the development of society”

“A society develops economically as its members increase jointly their capacity for dealing with the environment. This capacity for dealing with the environment is dependent on the extent to which they understand the laws of nature (science), on the extent to which they put that understanding into practice by devising tools (technology), and on the manner in which work is organized”
Evolution of National System of Innovation Studies


“It is a major challenge to understand how modes of innovation and innovation performance relate to the degree of inequality in a society both in the North and in the South. In a neo-liberal discourse inequality is seen as a factor that promotes entrepreneurship and initiative. In a learning economy discourse it might be seen as something that makes it more difficult to build social capital and trust that is the basis for interactive learning” (Lundvall et al, 2011)
1. The economy must be managed by private companies as they alone conduct themselves naturally as agents operating under the demands of open competition.

2. The labour market must be liberalised, ‘authoritarian’ minimum wage setting (and sliding pay scales a fortiori) must be abolished.

3. So-called public services - education, health, or even the supply of water and electricity, housing, transport and communications - where they have been provided by public agencies (state and local authorities) in the past - must also be privatised as much as possible.

4. Fiscal function should be reduced to the minimum necessary to cover only state functions (public order and national defence in particular); tax rates must remain relatively moderate, so as not to discourage private initiatives and to ensure that reward is guaranteed.

5. Credit management must be assumed by private interests, allowing the unrestricted interaction of credit supply and demand to develop on a rational monetary and financial market.

6. Public budgets must be designed to be balanced and without deficit, bar those of a circumstantial and short-term nature. … deficit must be covered through borrowing on the domestic or foreign private capital market.

7. The six principles in question must be implemented not only at the level of all nations of the globalised world, but also in international relations, at a regional (for example the EU) or global level. Private foreign capital must move freely and be treated on an equal footing with local private capital.

• “Liberalism creates nothing in the peripheries of the Global South, that agree to submit to it, other than a crony capitalism based on a Comprador State in opposition to the National State committed to sustainable economic and social development”
Reproducing Neo-Liberal Orthodoxies

• The resource dependence of developing countries’ development models that make them depend on economic theories and models that support financialisation, neoliberalism and globalisation

• The power of financial elites that benefit handsomely from these policies despite these costs to many others

• The unwillingness of most economists themselves to honestly face the profound problems associated with these theories and policies.

(Epstein: 2005)
self-Criticism: Building where we Work

• “Since Margaret Thatcher, the role of academia has been to service the status quo, not challenge it in the name of justice, tradition, imagination, human welfare, the free play of the mind or alternative visions of the future. ... there is no university without humane inquiry, which means that universities and advanced capitalism are fundamentally incompatible”

  (Eagleton: 2010)

• “Instead of leading people to the barricades, instead of addressing the most urgent issues our world is now facing, official philosophers are fighting amongst themselves for tenures, offering their brains and bodies to the Empire. At best, they are endlessly recycling each other, spoiling millions of pages of paper with footnotes, comparing conclusions made by Derrida and Nietzsche, hopelessly stuck at exhausted ideas of Kant and Hegel. At worst, they are out-rightly evil – making still relevant revolutionary philosophical concepts totally incomprehensible, attacking them, and even disappearing them from the face of the Earth”

  (Vltchek: 2016)
Critical Social Policy Analysis

• Critical social policy analysis must seek better understandings of the social phenomena of rising elite power, political privilege and social marginalization, both as new forms of imperial dominion and political control though unequal trade and financial regimes and as self-serving opportunism (Motala: 2007: 96)

• Understand the context in which social policies are applied as conjunctural to the broader developmental challenges which face such developing states and societies

• Critique must be clear and unambiguous, reflective and analytical, stating its underlying assumptions and values, clarifying its ideological standpoint, and based on careful study of the facts and good empirical evidence without being empiricist
### “World Scientists’ Warning of a Climate Emergency”

<table>
<thead>
<tr>
<th>a.</th>
<th>Human population (billion individuals)</th>
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<td>b.</td>
<td>Total fertility rate (births per woman)</td>
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<td>c.</td>
<td>Ruminant livestock (billion individuals)</td>
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<td>d.</td>
<td>Per capita meat production (kg/yr)</td>
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<td>e.</td>
<td>World GDP (trillion current US $/yr)</td>
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<td>f.</td>
<td>Global tree cover loss (million hectares/yr)</td>
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<td>g.</td>
<td>Brazilian Amazon forest loss (million hectares/yr)</td>
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<td>h.</td>
<td>Energy consumption (Exajoules/yr)</td>
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<td>i.</td>
<td>Air transport (billion passengers carried/yr)</td>
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<td>Total institutional assets divested (trillion USD)</td>
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<td>k.</td>
<td>CO₂ emissions (gigatonnes CO₂ equivalent/yr)</td>
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<td>l.</td>
<td>Per capita CO₂ emissions (tonnes CO₂ equivalent/yr)</td>
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<td>m.</td>
<td>GHG emissions covered by carbon pricing (%)</td>
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<td>n.</td>
<td>Carbon price ($ per tonne CO₂ emissions)</td>
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<td>o.</td>
<td>Fossil fuel subsidies (billion USD/yr)</td>
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<td>p.</td>
<td>Governments that have declared a climate emergency (#)</td>
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Source: Ripple et al, 2022
Remedying *anthropocentric* Arrogance

- **“Mantropocene”** (Raworth, 2014) - patriarchal power structure
- **“Technocene”** (Hornborg, 2015) - destructive logic of techno-scientific industrial extractivist capitalism
- **“Chthulucene”** (Haraway, 2015) - interspecies entanglements and articulation between humans and non-humans
- **“Capitalocene”** (Moore, 2016) - logic of capital and profit
- **“Plutocene”** (Solón, 2019) - concentration of power in the hands of an elite
- **“Wasteocene”** (Armiero, 2021) – othering of peoples and places rendered toxic and disposable
- **“ethico-onto-epistem-ology”** - inseparability of ethics, ontology and epistemology when engaging in (scientific) knowledge production, with scientific practices, and with the world itself and its inhabitants – human and non-human beings that intra-actively co-constitute the world (Barad, 2007: 90)

Note: BII = biosphere integrity; E/MSY = extinctions per million species per year; N = nitrogen; P = phosphorous.
What is Political Ecology?

• “…political ecology is not a method or a theory, nor even a single perspective”

• “… 19th Century political ecological critiques are all the more notable in light of the role that geographical and ethnological sciences were playing in the creation of empire”
  • People or Place

• “People who engage political ecology (among their many other tasks in the world) believe that the key to understanding environmental problems, struggles, crises, and opportunities lies in being able to read and write the contradictions, the ironies, the winners and losers, and the simultaneously real and represented natures of the world”

• “political ecology is an urgent kind of argument or text (or book, or mural, or movie, or blog) that examines winners and losers, is narrated using dialectics, begins and/or ends in a contradiction, and surveys both the status of nature and stories about the status of nature”

  (Robbins, 2011)

• “… ‘production of environmental interventions is intimately connected to the production of environmental knowledge, both of which are intrinsically bound up with power relations’

• This sort of research provides useful insights into the ways in which environmental problems and crises may be socially constructed.

• The objective, however, is rarely to suggest that problems and crises do not exist.

• Rather, it is to show how their selective identification and representation is a political process.

• Indeed, this process of knowledge production reflects, and in turn often reinforces, social and economic inequities in so far as knowledge claims may be used as the basis of socially divisive public policy.

• In this regard, then, it is possible to argue that knowledge production and material practices are conjoined in such a manner as to perpetuate or generate environmental problems and even ‘crises’ for socially disadvantaged groups”

  (Bryant, 1998)
# Five Dominant Narratives in Political Ecology

<table>
<thead>
<tr>
<th>Thesis</th>
<th>What is explained?</th>
<th>Relevance</th>
</tr>
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<tbody>
<tr>
<td>Degradation and Marginalisation</td>
<td>Environmental Conditions (especially Degradation) and the Reasons for their Change</td>
<td>Environmental degradation, long blamed on marginal people, is shown in its larger political and economic context.</td>
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<td>Conservation and Control</td>
<td>Conservation Outcomes (especially Failures)</td>
<td>Usually viewed as benign, efforts at environmental conservation are shown to have pernicious effects, and sometimes fail as a result.</td>
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<tr>
<td>Environmental Conflict and Exclusion</td>
<td>Access to the Environment and Conflicts over Exclusion from it (especially Natural Resources)</td>
<td>Environmental conflicts are shown to be part of larger gendered, classed, and raced struggles and vice versa.</td>
</tr>
<tr>
<td>Environmental Subjects and Identity</td>
<td>Identities of People and Social Groups (especially New or Emerging Ones)</td>
<td>Political identities and social struggles are shown to be linked to basic issues of livelihood and environmental activity.</td>
</tr>
<tr>
<td>Political Objects and Actors</td>
<td>Socio-Political Conditions (especially Deeply Structured Ones)</td>
<td>Political and economic systems are shown to be underpinned and affected by the non-human actors with which they are intertwined.</td>
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</tbody>
</table>

Source: Robbins, 2011
Emerging Lessons from Political Ecology Studies

• “... historical political ecology is a means of identifying historical socio-natures and a way of understanding ecological changes that can help advance biodiversity conservation science and policy” (Mathevet et al, 2015).

• “There is no agency-structure puzzle here: simply different types of questions that need to be addressed using different tools and focus” (Dowding, 2008)

• “… reveal the connections between social-environmental struggles (collective action with specific spatial narratives and practices), emerging grassroots innovations (exceeding the limits of the local in their imaginaries and practices), and broader structural factors that cause, enable or limit these struggles” & “... explore how radical grassroots innovations stemming from place-based community struggles and social movements relate to resistance practices, that not only successfully oppose inequality and the withering of the commons in the short-term, but also open long-term pathways to alternative modes of social organization, a new commons, based on social needs that are currently ignored or marginalized” (Apostolopoulou et al, 2022)

• “… insights from actor-oriented perspectives are useful for examinations of efforts and successes in exercising power by corporations, state agencies, NGOs, and others”

• “… power perspectives grounded in neo-Marxism contribute to understand how constantly changing economic structures provide opportunities for capital accumulation for some actors, while at the same time, many others are disempowered and marginalized”

• “… political ecology should continue to uncover exercises of discursive power by elites as well as ways in which dominant discourses are modified, adapted and resisted” (Svarstad et al, 2018)

“... ecological innovation is a need of the current era because of reducing the adverse effects on the environment through maximum consumption of the resources in an environment-friendly manner; hence more predictors need to be studied which can explain this phenomenon in further detail” (Shen, 2022)
Pre-conclusions

“True development in the [global South] requires investment in human capacities and a new scientific and technological revolution to fulfil human and planetary needs, cooperative integration of economies to enhance industrial, data and human resource chains and sustainable connectivity and green infrastructure to diffuse the gains widely” (IMG, 2021)

“In a world defined by uncertainty, we need a renewed sense of global solidarity to tackle our interconnected, common challenges” (UNDP, 2022a)
Conclusions

“To predict what direction science will take in its further development is, evidently, impossible. As long as [people] of science depend upon the rich and the governments, so long will they of necessity remain subject to influence from this quarter; and this, of course, can again arrest for a time the development of science” (Kropotkin, 1903)

- Redress Epistemicide – Imperial, Colonial, Post-colonial, and Neo-colonial
- Embrace the Prospective Potentials of Traditional and Indigenous Knowledge Systems
- Democratisation and Science for the People
- Critique, and contribute to enjoining the study of the political ecology and innovation …
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Dankie
Thank you
Ngiyathokoza
Enkosi
Ngiyabonga
Ke a leboga
Ke a leboha
Ke a leboga
Siyabonga
Ndo livhuwa/ Ro livhuwa
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