DRAFT POSITIONING PAPER

Thematic track 6:

Pedagogies to Advance Sustainability in African Tertiary Education

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Committee consisted of academics in the Faculties of Humanities, Science, Engineering and Built Environment, Health Sciences and the Executive. Attendees are listed in the Acknowledgements.

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1. Introduction: Sustainability as an Invitation to a Paradigm Shift in Higher Education

Universities, through their functions of research and education, play a significant role in shaping and influencing society's ability to respond to current contexts as well as future social, economic and environmental needs. The current global situation of crises in respect of health (Covid), inequality and climate (wildfires, hurricanes, droughts, floods, extinction risks) demonstrates the present dynamic context that graduates face.

The conditions of the present planetary crisis known by geologists as "the Anthropocene", in particular, underscore the limitations of current disciplinary approaches to tertiary education. Given that human activity has become a planetary force, it is no longer possible to assert the rationale for the division of the natural from the human sciences.

That problem Universities must face is that its teaching structures are profoundly social and cultural, formed in the crucible of histories in which early European scientists fought with the church for the right to think independently, and offered the bifurcation of spirit and matter as a way forward.

The separation of culture / society from nature was therefore hard-wired into University life. Yet its core proposition -- of the separation of the human from the planet, and of science from society -- is not empirically viable and, in the time of the Anthropocene, no longer tenable as the basis for education.

In this context, the call for tertiary education to explore how to advance sustainability, is vital and welcome -- and goes to the core of the global university project. It offers a possibility for a long-overdue "institutional reset" to address our collective inheritance of the form of "the University".

With the support of innovative, independent funders, multiple research projects across universities have developed transdisciplinary research programmes. New transdisciplinary fields have emerged that link across disciplines, for example:

- biogeochemistry -- linking earth and life sciences, problematising the distinction between life and non-life
- epigenetics and neurobiology -- linking dormant genetic or neurological structures with life-events that initiate their action
- industrial ecology and urban metabolism -- understanding cities as specific interventions in material flows
- climate modelling -- linking petrochemical societies with changes in earth systems
- critical zone studies -- studying the conditions of habitability generated from water and nutrient cycles between bedrock and treetop at any point on the Earth's surface
- environmental humanities -- conceptual frameworks governing nature-society relations, and their material instantiation.

Few of these emergent fields, however, make their way into undergraduate teaching which remains dominated by disciplinary methods and research questions.

This institutional framework, shared by most universities, generally structures the extent to which natural and social problems are presented to students, thus depriving them of the opportunity to develop a deeper, more authentic, and potentially more transformative understanding of the world in which they will live and work. Even where undergraduate students require a solid disciplinary foundation, interdisciplinary and transdisciplinary courses offer the opportunity to develop a new and different type of capacity to advance wellbeing as proposed by the Sustainable Development Goals.

Mcebisi Ndletyana, associate professor at the University of Johannesburg (UJ) and political analyst, recently proposed that universities should expose natural or “hard” science students and engineers to the social sciences. “We [South Africans] were in a rush to build engineers. Our whole thing was we needed to grow our economy, that people were just mechanical beings without a consciousness,” he said.[1]

Ndletyana's proposal is that exposing scientists, doctors and engineers to the social sciences and humanities will help them better utilise their skills.

The inverse is also true: social science and humanities students need to learn to think generatively with the sciences and technical disciplines.

If the implication of the call to advance planetary sustainability and habitability is that teaching sustainability requires an "institutional reset", then this is the moment to propose a framework that rethinks the ecology of tertiary education, so that the immense potential of undergraduate education can be "unleashed" via cutting edge teaching that simultaneously engages both leading sciences, and the limitations of modernity and coloniality.

Building on the core principle that in order to advance sustainability through teaching, universities ought to model their concern and their commitment in the very manner in which sustainability is taught. This implies crossing disciplinary boundaries and rethinking curriculum to bring nature, society and infrastructures, together.

Advancing this conversation, this document opens with **a proposal for a problem-based undergraduate curriculum** (section 2a) in which students are invited to apply the principles of sustainability to advance wellbeing in a specific local context.

Second, we sketch **a dynamic model of teaching delivery** (Section 2b) that aspires to advance a African north-south conversation on pedagogies for sustainability (Section 2c).

Third, this document proposes that to advance sustainability, **Universities in Africa could create a network of transformative research and teaching hubs**, linking innovative transdisciplinary research to the development of innovative curricula (Section 2d) that are Africa-focused.

In the Appendices, an inventory of existing projects are offered to supplement the workshop discussion.

2. The Challenge of the Sustainability Agenda: Teaching Integrated, Responsive, Big-Picture Thinking

To teach sustainability literacy is to impart the skills to rethink the modernist inheritance of dividing knowledge into nature v. society -- a dualism that is hardwired into the global university system, and the Anthropocene, alike. Teaching that capacity, however, requires equipping both teachers and students to think in new ways -- that is, "outside the box". For that reason, a learning-by-doing process is proposed, linked in to a space for students to contribute their projects in an online forum for African and global dialogues on advancing sustainability.

2.1 Developing Principles for a Pedagogy to Advance Sustainability

a. A Case Study-Based Teaching Approach

"Thinking outside the box" is a familiar aphorism. A less familiar adaptation of it: "Think outside: No box required".

Real-world situations offer the opportunity to engage experience without it being pre-filtered by disciplines, or organisational siloes.

With this principle foremost in mind, our team explored the possibility of building an undergraduate course focused on sustainability concerns, in a specific locale near to a University, where the unsustainability of contemporary urban life is in full view.

In Cape Town, **the Cape Flats south**, on the Indian Ocean edge of Cape Town, provides such an example (Figure 1). Comprising farmland, nature reserves, tourism destinations, a City-wide waste dump and

sewage works, shacklands, working class housing and a failed desalination plant, this piece of Cape Town exemplifies the contradictions of the Anthropocene, and at the same time bears witness to the impact of the history of South Africa and Cape Town on nature and society: a racialised space where unsustainable waste-management and sanitation infrastructures slowly contribute to progressive toxicity underlining the low-key quotidian violence faced by inhabitants.

The Cape Flats south also shows what happens when property boundaries take precedence over earthly flows in the conceptualisation of what is needed for environmental policy and governance to advance habitability. The Cape Flats south poses these deep questions about the thinking behind environmental governance and planning, because it does not matter where one lives, much of the city's waste ends up in this landscape. This site generates questions such as:

- How and why does this landscape exemplify unsustainability?
- Is this "the Africa we want"? Why? Who are "we"?
- What struggles are playing out here, over collective futures?
- What changes would advance habitability and wellbeing?
- What possibilities arise for innovative solutions?

A course designed to address the actual material flows in such a landscape foregrounds the processes of sedimentation that enact specific futures. The material flows of everyday life create landscapes of wealth and poverty. So do its blockages: nutrients out of place, in the waste dump and sewage stream instead of in soils. Methane from the waste dump may be a resource. Waste-pickers assist with recycling. A nature reserve with Cape Town's last five hippos is expected to provide "ecosystem services" to process pollutants. Rivers and lakes are fouled, and the sea water is so polluted that it was unable to be desalinated. This is Cape Town's "anthropocene". End-of-pipe solutions have made it unsustainable.

Our challenge to ourselves, and to future students:

- Is it possible to advance Agendas 2030 and 2063 in this landscape? Do they pose the most useful questions?
- If an undergraduate curriculum were to be developed to pose this question, what ought it to address?
- What principles would inform the pedagogy?
- How do discussions of this context, link to discussions about similar themes, elsewhere in our shared planet?
- What discussions are going on globally, among youth, about our shared planetary future?

Figure 1: Cape Flats South (Google Earth)

b. Resources for Developing Pedagogical Principles: A Survey

In exploring the above as a potential curricular case study around which to teach sustainability, we looked at a number of resources, particularly African resources, that advance African engagements with sustainability.

§1 UCT Inter-departmental Undergraduate Initiatives

A number of inter-departmental initiatives at UCT are already under way to broaden undergraduate students' capacity to explore sustainability in a complex and changing world. These include:

- Three undergraduate curricula are already developed and draw off the UCT Global Citizenship programme(GCP) a soft-funded programme of largely co-curricular short courses based in the Centre for Higher Education Development at UCT ("CHED"). The GCP was established by A/Prof Janice McMillan in 2010 and is currently led by Dr Benita Moolman. Through engagement, partnerships and dialogue with innovative teachers at UCT, 3 credit-bearing courses have built off the GCP courses and are taught to students in engineering and commerce, although both the courses taken by engineering students are open to all students across faculties:
    - Social Infrastructures - END109P (a Humanities elective for engineering Students)
    - Service-in-Context – HOCIP – Honours Outreach and Community Involvement Programme: INF4026F (Information Systems students in the faculty of Commerce)
    - The Citizen Professional in engineering and the built environment END2013S (designed as a Humanities elective for engineering students)
- The New African Urban University project led by A/Prof Zarina Patel (Environmental and Geographical Sciences / African Centre for Cities) is developing a research agenda to

strengthen the role of African Universities to advance just and sustainable transitions in African cities. The initiative centres around building a partnership between nine universities from Africa and beyond, collectively engaging with three systems: research, curriculum development and engaged scholarship. A key objective is to create spaces for global and local dialogue about the necessary systemic changes in different high education contexts. By advancing the idea of the New African Urban University, the initiative offers the opportunity to recognise African universities for their role as urban actors who can shape city processes, through generating new knowledge, developing competencies, and through convening alternate partnerships.

- Environmental Humanities South is leading a research initiative developing a transdisciplinary "critical zones" approach to the planetary crisis, working on case studies in a seven-African-country partnership (Addis Ababa, Nairobi, Dar es Salaam, Lilongwe, Eduardo Mondlane, Zimbabwe, Cape Town), together with the Human Sciences Research Council. The project is led by Prof Lesley Green and A/Prof Frank Matose with Site PIs at each partner university. On receipt of recently awarded funding, we will have the capacity to manage an experimental interdisciplinary course for the years 2023 -2025.

These undergraduate initiatives currently share three challenges regarding their institutional sustainability:

- ***Human resources***:
  - They are predominantly soft-funded and driven by personal dedication to advancing professional excellence, often at considerable personal cost -- and are not part of the formal economy of UCT.
  - Departmental (HOD) acknowledgement of teaching time on these courses, in terms of allocation of teaching loads to staff, is not guaranteed, since course codes track the workload and fee-income to a single department or Faculty.
  - Multiply-coded courses (eg different disciplinary codes per module) are ineffective in respect of examinations; management; administration; marks processing.

- ***Integration of Teaching and Research Finance***:
  - Transdisciplinary teaching initiatives generally originate with donor funds (especially but not exclusively for research) but their financial sustainability is not ensured on conclusion of a grant, since there currently no mechanism by which an experimental course may demonstrate its contribution to the University, and therefore ensure its sustainability.
  - Soft-funded staff who teach innovative fields, funded on research grant money, are therefore unable to secure positions, and are at risk of being hired elsewhere.

- ***Financial architecture linked to course codes***
  - "hard wires" into the University, the separation of the various sciences and humanities.
  - Departmental examiners may not understand transdisciplinary work.

These difficulties exacerbate the disconnection between advanced research and the development of undergraduate curricula, and as a consequence this deprives the undergraduate curriculum of opportunities for innovating in their knowledge base.

An "incubator" for transdisciplinary curricula, is therefore proposed.

§2: Single-department undergraduate courses that address the SDGs at UCT

The following courses that address sustainability as a concept, at an undergraduate level, are taught in these departments:

- Students of Sociology who take "Poverty, Development and Globalisation" (SOC2030f/SOC2034f) take a module on Sustainable Development taught by Michelle Pressend.
- Students of Environmental and Geographical Sciences study Sustainability in "Society and Space" (EGS2015S / Dr Suraya Scheba); and a module on "Sustainability and the Environment" (EGS 3021F / Dr Gina Ziervogel).

While the above courses are integrative, they are not institutionally integrated across disciplines, departments and Faculties, and therefore do not offer students exposure to the expertise, concerns and problems identified in a wide range of disciplines. With this in mind our proposal is twofold:

- To develop an experimental undergraduate curriculum which is framed around a "learning site" which foregrounds sustainability challenges, and which is accessible to students of the University and co-taught by academics from different disciplines, departments and faculties;
- To establish an innovation hub, in which experimental sustainability teaching across multiple departments and faculties, could be incubated, in ways that are not predetermined by the limitations accruing to institutional administrative, financial and human-resource structures.

§3 Looking Beyond UCT: Wider African Initiatives

What is striking in a survey of African sustainability initiatives, is both (i) the strength of African civil society and community-based education for change that advances habitability, and (ii) the relatively low involvement of formal African universities in their work.

Some examples:

- School of Ecology, **Health of Mother Earth Foundation (HOMEF)**[2] Led by Nnimmo Bassey, an architect, environmental activist, author and poet in Nigeria, HOMEF has set up a School of Ecology in partnership with the University of Lyons. HOMEF also runs a hub called *Ikike* which aims to create spaces for knowledge creation, sharing and interrogation through platforms such as the Sustainability Academy, Community Dialogues and Conversations space. HOMEF provides resources to grassroots communities working on environmental justice and sustainability across Africa. The HOMEF SoE exemplifies the potential for universities support community learning.

- **Cala University Students Association (CALUSA)**[3] was formed in the village of Cala in the rural Eastern Cape of South Africa, by among others, Prof Lungisile Ntsebeza, back in 1983 to assist young activists who had been imprisoned in 1976 and released in 1981, and to support students who, in the context of the schools boycott, were not physically attending school. The method of these reading groups was to study "great texts", through careful, intentional reading of multiple texts that provided the opportunity to understand and critique the conditions of apartheid. CALUSA has continued to grow and develop new learning projects with the local community.

- **The Wangaari Maathai Institute for Peace and Environmental Studies** linked to the University of Nairobi, addresses questions of environmental governance at graduate level. "The world is characterized by skewed trade in natural resources, deforestation, geopolitical struggles over oil and gas supplies, desertification and increasing environment-related diseases among other issues. This raises important questions about how humans currently -

and in future should organize the governance of natural resources and environments upon which they depend. ... In response to the needed human capacity in this area, the institute has developed a multidisciplinary and experiential learning program in environmental governance studies." The Institute originated in the civil society movement organised by Wangari Maathai, who won the Nobel Peace Prize in 2010, and whose works continue to give direction to the emergence of an African environmentalism.

- **Environmental Justice North Africa (EJNA)** articulates the concerns of many similar African organisations, whose primary concerns address environmental justice globally, and at community level, and pose crucial and difficult questions about what sustainability is, and what its relation is to the current global economy that continues to impoverish Africa. "Environmental Justice North Africa (EJNA) is a not-for-profit organisation campaigning around issues of environmental and climate justice as well as energy democracy in North Africa. We aim to advance progressive ideas and arguments around themes that range from climate change to energy sovereignty." A key part of their work is redefining the concepts that drive sustainability, e.g. "“Climate Justice” usually involves a recognition of the historic responsibility of the industrialised West in causing global warming and bears in mind the disproportionate vulnerabilities faced by some countries and communities; “Environmental Justice” is usually centred around community needs, making the fossil fuel industry and other large industries accountable and move towards a sustainable relationship to nature; Energy democracy” and “Energy justice” mean creating a future in which energy is fairly distributed, democratically controlled and managed, and our energy sources and transmission systems are in balance with the environment and the needs of future generations."

- **Friends of Lake Turkana** has since 2010 worked in Kenya to protect Lake Turkana's ecosystem, defend lands and territories, increase women's voices in critical social-economic decisions at the county level; demand environmental and climate justice and advance the rights of pastoralists and indigenous peoples in the Turkana Basin.

- **Alliance for Food Sovereignty in Africa (AFSA):** Advocating for "a people-centred system of sustainable agriculture, combining indigenous knowledge with cutting edge science, making the best use of nature to create healthy communities, and empowering a social movement that resists the corporatization of agriculture [and] support small-scale food producers to build a sustainable, resilient, diverse, healthy, productive, and culturally appropriate food system for Africa."

Many African environmental organisations like these are advocating a critical yet generative engagement with the global push for sustainability. They share an uncertain engagement with African Universities, even as they are very much involved in teaching, resource development, and ongoing struggles to demand that governing elites address unsustainable extractivism and waste flows to and across the continent. Not infrequently this is at the cost of the lives and wellbeing of activists who, to advocate for sustainability, must confront powerful fiscal and commercial interests.

Their voices are crucial given widespread dissent, in Africa, Asia and Latin America, with financialised approaches to environmentalism and development framed via the values and ideologies of neoliberalism, including the idea that markets place the correct price on resources; that human beings are primarily motivated by financial benefit ("Homo economicus"), and that Gross Domestic Product is the primary guarantor of wellbeing.

African dissent with current global climate agreements is critically important for the global north to hear. Before the signing of the Paris COP agreement in 2015, which brought formerly colonised countries into vital global carbon reduction agreements,

> *"It is just like apartheid," Nozipho Joyce Mxakato-Diseko, South Africa's delegate who speaks on behalf of the main grouping of more than 130 developing nations and China, told the meeting. "We find ourselves in a position where in essence we are disenfranchised," she said, saying the views of the poor had been ignored. Developing countries said the draft, drawn up by two senior diplomats, favoured rich nations and failed to stress that developed nations needed to take the lead in cutting greenhouse gas emissions and to provide far more aid and clean energy technology.*[1]

Dissent in Africa renders global mitigation policies such as REDD+ vulnerable to lack of implementation. While they may be signed at an inter-governmental level, a number of situations indicate that they may be unsustainable at a local level -- for example, the massive illegal timber harvesting in Mozambique despite the protection of forests by REDD+ agreements.[4] The phrase "climate apartheid" has been used by Archbishop Emeritus Desmond Tutu;[2] by a UN special rapporteur on human rights and climate change;[3] and by a team of academics writing in the journal *Environment and Planning E: Nature and Space.* From their abstract:

> *While the uneven causes and impacts of climate change are widely known, it is also becoming evident that many elements of the response to the climate crisis are also reinforcing discrimination, segregation, and displacement among marginalized peoples. This is entrenching a system of climate apartheid, one that is evidenced by uneven vulnerabilities to the climate crisis, as well as inequitable implementation of climate-oriented infrastructures, policies, and programs. These efforts often secure privileged populations while harming, excluding, and criminalizing populations whose lives have been made precarious by climate change.*[4]

This brief survey of Africa's major environmental organisations and thought leaders demonstrates that engaging sustainability in Africa requires addressing historical injustices as they are embedded in the current global economic system, and its established ideas of natural resource extraction, and the capacity to imagine alternatives. The pedagogy that is needed is one that encourages engaged, responsive and generative critique with the world systems of which we are the inheritors. Crucial in this regard is facilitating the reconnection of students' senses of self and body, with ecology, as it is that link that was broken in waves of land dispossession and slavery, as well as an approach to knowledge that separated mind from body, and humans from nature.

c. Nine pedagogical principles for integrated learning in African Tertiary Education

The challenge facing higher education leaders in Africa is how to build pedagogic capability and capacity for the development and delivery of new forms of university teaching. This requires a paradigm shift, and STEM sciences alone are inadequate to the task. In extensive Task Team discussions, the pedagogical principles that are necessary to teach sustainability, are identified as follows:

i. **Integrative:** The challenge of advancing sustainability begins with resolving the binary at the core of the Anthropocene: the division of society from nature in terms of curriculum and pedagogy.

> *The invitation to advance the Sustainable Development Goals and Agenda 2063 is simultaneously an invitation to Universities to rethink inherited structures of teaching; modes of delivery, and paradigmatic frameworks.*

ii. **Problem-based:** It focuses on an existing problem in the confluence of the natural and social. Designed to improve everyday life and integrate human rights with habitability in a time

[1] South Africa compares global climate plan to Apartheid, *Mail and Guardian*, 20 October 2015. https://mg.co.za/article/2015-10-20-south-africa-compares-global-climate-plan-to-apartheid/

[2] Tutu, D. Climate change is the Apartheid of our Times: Boycotts, sanctions and divestment proved effective in South Africa, but that required a mindset shift. *Financial Times,* October 3 2019.

[3] A'Climate Apartheid' Is Right Around the Corner, UN Warns,*Global Citizen*, 29 June 2019. https://www.globalcitizen.org/en/content/climate-apartheid-un/

[4] Rice, Long and Levenda, 2021.

of planetary crisis, sustainability goals are best achieved with reference to problem attached to a local case study, in dialogue with people and community organisations on the ground.

Problem-based teaching, based on a local situation, will advance conversations across disciplines, equipping graduates to bring on board multiple skills and capacities.

iii. **Deliberative:** The advancement of the SDGs and Agenda 2063 requires the skills to make informed decisions that address collective goals and promote habitability and wellbeing for all, not only the few.

Understanding different interpretive frameworks of "Sustainability". Learning how evidence is produced in answer to specific questions and assembled via specific techniques (e.g. maps; spreadsheets; databases) that address sectoral concerns.

iv. **Astute:** A global agenda such as that of the Agendas 2030 & 2063, constitutes a rationale for governance, for research, and for the release of resources. As with any global agenda for action, the adoption of its rationale constitutes a lever that can and will be appropriated to different ends.

Teaching "sustainability literacy" will equip students to read, recognise and respond to different appropriations of the Agendas; understanding and negotiating interpretive frameworks and competing agendas.

v. **Responsive:** Understand how to engage multiple sectors, especially marginalised voices.

Learning how to hear those who most often silenced. African HE graduates trained in advancing sustainability will be characterised by their "response-ability" to the total context.

vi. **Present:** Grounded in colonial approaches to knowledge production that silenced local knowledges and worldviews, Higher Education remains overwhelmingly a space of marginalisation for many African students.

A focus on lived experience will facilitate the presence of learners as whole selves, in their learning. Embedding learning in a local environment equips students to bring into the classroom what they already know, and test, hone and connect life knowledge with classroom learning.

vii. **Generatively Critical:** Stemming from the best critical traditions of the 20th and 21st centuries we look at problems and disciplines in terms of their historical constitution and the relations of power they represent. However, critique of ideas alone are inadequate to the task of addressing current challenges.[5]

Students will be invited to develop the skills of generative critique and mutually respectful transdisciplinary engagement. Social science students will be invited to engage with material flows; science students with the power of ideas. All students will engage with policy, governance, infrastructure, planning and decision-making.

viii. **Transdisciplinary Methodological Excellence:** The paradigm shift that is required to support a global move to sustainability, requires both innovation in big-picture approaches, ideas and questions; and methodological excellence.

Students will understand how research questions can be framed and knowledge is tested in different disciplines.

ix. **Collective-Based**: Students will learn to work in teams with different expertise, in dialogue with communities, and will present their projects as part of the class learning.

Our courses avoid the "banking model" of learning. Our students will recognise their learning process is part of world-making practice.

2.2. Sample Experimental Transdisciplinary Curriculum for Sustainability: Beginning with Cape Town

Building on the above principles, the following course outline offers a "working outline" for place-based learning, is offered for discussion.

Table 1: An experimental curriculum

Wk	Pedagogical Goal	Content, Activities, Projects
1	**Course Introduction**	The study site: Overview of the Cape Flats South in Google Earth (CFS) with a focus on it as a space of the Commons: a nature reserve; a City waste dump; a City sewage treatment works; the aquifer, beaches, shacklands, farmland and desalination plants. Looking at the flows from the City to this space
2	**Our Shared Present: The Commons**	Understanding the idea of the Commons: in air, water, land; Common wealth and common poverty via the idea of urban metabolism. Input from local community struggles e.g. Rap artists; graffiti artists; community organisations; conservationists about habitability. Focus on urban metabolism: "Skarreling" (waste picking); Recycling; Waste-dump gas harvesting; Ramsar Site.
3	**Pasts Present**	Engaging activists, and colleagues from geology, archaeology and history of the area. Understanding different “big pictures” and contending views and values. Input from June Bam; colleagues in historical studies; geology; palaeobotany. Geology as the study of sedimentation: How do our present everydays create new sediments?
4	**Futures Present: The Africa We Want**	Engaging activists, policy, science, arts of the area: Understanding different “big pictures” and contending views and values. Input from activists (e.g. Princess Vlei); engineering (energy; waste & sanitation); climate modelling; literary studies. The SDGs and the problem of material flows and nutrients/matter out of place.
5	**Learning to See & Question**	Field Trip and Group Projects on Unsustainabilities: The seen and the unseen · Flows v Fences: Comparing maps to Google Earth. · Relationships and Objects: where are relationships, on Google Earth?
6	**Learning to Be Present**	Thinking from your feet. What is it to do research? For whom? Where do your research questions come from? What experience do you bring to the situation? Developing group projects on the present unsustainabilities.
	Term break	Project 1 finalised in Groups, posted on website: Unsustainabilities
7	**Learning Together**	Project 1 Presentations: Unsustainabilities; Community groups included in responding to presentations. Begin developing Project 2: Proposals and Innovation: How can specific Unsustainabilities turn to Sustainabilities? Linking to Agendas 2030 and 2063.
8	**Learning to Hear**	Community concerns as research questions; Stories; Understanding different sectors of action about unsustainabilities: Presentations from Officials; Activists; Faith-based Communities; Framing Questions in relation

		to Sustainability Agendas. How does deep listening change the story you tell?
9	**Learning to Imagine Solutions**	Developing Project 2: Proposals and Innovation: How can specific Unsustainabilities turn to Sustainabilities? Stories from Elsewhere; library research on comparable solutions
10	**Learning to Re-Think**	Questioning Key Words e.g. “Development”; “Sustainability”; Working towards paradigm shift. Finalise Project 2
11	**Learning to Propose and Innovate: Design, Infrastructure and Solutions**	Present Project 2: What solutions to your team's problem have been tried elsewhere?
12	**Learning to Negotiate: How to prioritise, trade-off and reach consensus?**	Learning the arts of mediation -- facilitated exercise in negotiating
13	**Course Review**	What we did -- what it means, and how it links to wider scholarship.

2.3. A Network of Comparable Courses? Leveraging Online Teaching to Build a ReGenerative African Student Network

Noting:

- the urgency for supporting an African approach to environmentalism that encompasses the colonial experience and a critique of contemporary global economic systems;
- the value of comparative learning;
- the need for African universities to work together to address common challenges in devising pedagogies that advance sustainability in Africa for Africa;
- the potential of online technology to facilitate project sharing between students who are addressing common questions in different contexts;
- and further noting the need for many mid-career professionals to "retool" via universities in order to address sustainability challenges.

--***our proposal is to work towards building a network of undergraduate courses at multiple partner universities in which similar curricula are taught over roughly the same period, each with reference to a local study site, in which students share the projects that they develop, and are able to converse and compare their findings and proposals both at their own university, and on a website that facilitates comment and discussion -- and north-south engagement between students globally, on what sustainability means in their own proverbial backyards.***

2.4. A Network of African HE Hubs for Innovation

Further, noting that:

- sustainability curricula often run counter to the grain of established financial, disciplinary, humane resource and administrative architectures established in universities, and

- these difficulties often render sustainability studies unsustainable,
- these difficulties also slow down or impede the development of tertiary-level sustainability initiatives notwithstanding the context of urgency,
- and further that changes are necessarily experimental and incremental as we work towards new approaches to "best practice" in teaching and administrative systems.

-- our proposal is that several African Universities work together to create a network of "sustainability curriculum incubators" into which innovative research and teaching are integrated, and multiple sustainability curricula developed, and shared, across the continent.

3. Next Steps

a. Invite a network of African university teachers across disciplines, across African universities, to develop comparable courses in which there is a local case study that focuses on metabolism and flows as terra-forming activities in a local site

b. Proposal Development: Fundraise for workshops; a partnership infrastructure; identify logistical requirements; ensure network access; funds for support staff; library resources; translation tools (e.g. Arabic, English, French, Portuguese, Swahili)

c. Curriculum Development: Partner Universities engage communities and one another; Workshop curricula in relation to comparable sites; design student projects and platform for comments

d. Build Project Infrastructure: Create an online platform for students to share projects and be in communication

e. Project Launch: Courses are taught in the same range of the year, independently at each university, with shared student projects

f. Student Conference on Advancing Sustainability: Best projects presented for discussion with officials, policy makers, university leadership, students, communities. Publication on open website.

4. References and resources:

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6. Addendum: Innovative Approaches to Sustainability in Tertiary Education

- **HKW Anthropocene Campus:** In collaboration with the Max Planck Institute for the History of Science in Berlin and other partners worldwide, HKW is a global leader in supporting the development of curricula that address the complex transformation processes of the Anthropocene through collaborative and transdisciplinary practice of knowledge production and dissemination. HKW has been continuously developing an *Anthropocene Curriculum*, a steadily growing corpus of experimental research questions and designs, field studies, educational and participatory formats, responding to the necessity to think beyond the institutional framework of natural vs social science. Sub-projects have included the **Mississippi: An Anthropocene River** and **Deeptimechicago.**

- **Himalayan Institute for Alternatives (HIAL)** is an innovative university for training engineers from Himalayan villages to identify local concerns and local resources and solve problems simply and appropriately. Founded by engineer Sonam Wangchuk (recipient of the Rolex Innovation Award, 2016), their key focus is learning, doing and integrating research with teaching via "live learning labs". Pass rates of engineers have increased substantially.

- **SDG Academy:** The SDG Academy is a global initiative for the United Nations that offers free, open educational resources as a public good on sustainable development. It is linked to the **UN University**, a global think tank and postgraduate teaching organisation headquartered in Japan, working with leading universities and research institutes to promote collaborative research and education to address contemporary global problems on planetary survival and well-being.

- **Institute for Interdisciplinary Research into the Anthropocene (IIRA):** The IIRA aims at framing the processes and thinking through consequences and actions of collaborative work, action and efforts between academics, policy makers and global community activists in the Anthropocene era.

- **McGill University, York University and University of Vermont – Economics for the Anthropocene (E4A)** is a graduate training and research partnership designed to improve how the social sciences and humanities connect to ecological and economic realities and challenges of the Anthropocene. Overarching goals are to articulate, teach and apply a new understanding of human-Earth relationships grounded in and informed by the insights of contemporary science. Based at **McGill University**, **York University** and **University of Vermont**, **E4A** forms the core of the partnership that includes academic, government, and NGO **partners**

- **University of Iowa, School of Urban and Regional Planning - Eight Generational Planning: Envisioning Cities for the 2228** : an undergraduate course on regenerative city planning where students are encouraged to imagine futures and design a city that is regenerative and equitable (i.e., planning for hope!) in the Anthropocene, using urban strategies for sustainability, resilience, human well-being, and social inclusiveness.

- **African Research Universities Alliance**[6] is a network of 16 universities was created in Dakar in March 2015. The 16 universities are in different countries and have different

historical backgrounds but share a common interest in improving and enhancing research done in and by Africa by sharing and bridging resources as well as drawing on resources externally to support the increasing number of researchers in the region. The purpose on the network is to address the various sustainable development challenges in Africa by supporting research and graduate training through various channels including through the setup of Centres of Excellence (CoE).

- **Partnership for African Social and Governance Research**[7] (PASGR) is a non-partisan and independent NPO that supports research in governance and policy that impacts the well-being of men and women on the continent. In partnership with academics, activists, research think tanks, business and policy communities PASGR supports knowledge production and dissemination of policy related research and offers short professional development courses. The organisation facilitates collaborative HE programmes.