UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

PROFESSOR IMRAAN VALODIA

PRO VICE-CHANCELLOR: CLIMATE, SUSTAINABILITY AND INEQUALITY

Wits Inter-faculty Symposium on Climate, Sustainability, and Inequality 2024

Summary Report

Wits University has, for the third time, brought together a range of researchers in the field of climate change and inequality, at the Inter-faculty Symposium on Climate, Sustainability, and Inequality. The Pro Vice-Chancellor's Office has done so with the objectives to:

- Share research and innovation on climate, sustainability, and inequality across the university.
- Identify new research areas, particularly with cross-disciplinary approaches.
- Identify opportunities for partnerships across faculties, with other universities, and other relevant institutions more broadly.
- Promote interdisciplinary collaboration across the university.
- Develop an agenda for advocacy on both national and international issues related to climate, sustainability, and inequality.

The symposium took place on July 31st and August 1st, 2024, featuring presentations by Wits staff, postdoctoral fellows, PhD students, and for the first time, master's students, all on the themes of climate, sustainability, and inequality. A keynote lecture was also given by Professor David McDermott Hughes of Rutgers University. Held at the Wits Club, there were over 70 attendees and 25 presentations from researchers representing each of the 5 faculties at Wits.

There were also 9 master's students' and 2 PhD students' posters on display. This report provides an overview of the symposium and each session.

Day 1 – 31 July

Opening

The symposium was opened by Professor Ruksana Osman. She further emphasised the importance of sustainability as a strategy to the university, recognising the role the symposium plays in this by fostering innovation, advocacy, and inter-disciplinary research. Professor Osman posed three provocations to the attendees. The first was whether universities can be neutral in light of crises such as the climate crisis. The second point emphasised the significant role that the educational discipline and teacher training should play within a sustainability strategy to influence various other societal sectors. The third was how to address the challenge of inter-disciplinarity and trans-disciplinarity within the university structure. She finally emphasised that there are programmes being directed by the university towards this latter challenge. These include the Wits-Edinburgh Sustainable African Futures programme and the Pan-African College on Sustainable Cities which she encouraged master's students to consider entering.

This opening was followed by a presentation by Professor Francois Engelbrecht which established the urgency of the climate crisis and remained as the contextual foundation of many presentations following. Professor Engelbrecht noted that the last year has seen a definitive breach of the 1.5-degree Celsius limit, which may result in irreversible climate change effects. The presentation also explored the El Niño weather pattern as exacerbating drought in Southern Africa, noting the difference between natural variability and climate change. The presentation stressed the importance of multilateral cooperation due to the global nature of climate change and the significant efforts required to mitigate it. Professor Engelbrecht noted that a failure to reduce emissions could cause drier conditions in Southern Africa, increased rainfall in Lesotho, and detrimental impacts on food security. This presentation portrayed the urgency of climate change as well as the importance of not only mitigation, but adaptation ahead of possible severe effects.

Session 1: Sustainable agriculture and socio-ecological relationships

The first session began with a presentation by PhD student Michael Tafadzwa Nyamajiwa on smallholder irrigation schemes in Zimbabwe and their failure to mitigate against drought. This study found challenges to smallholder irrigation to be located within technical, economic, socio-political, and environmental exigencies. The study proposed a resilience for development model, consistency of policies, market linkages, and farmer education on climate change. Ammaarah Darsot then presented her PhD research evaluating the effectiveness of a human factors approach to co-designing outputs of a seasonal forecast system for grain farmers in the Western Cape to improve resilience to climate change and variability. This study interviewed farmers to understand their experiences, explored the effectiveness of various types of forecasting systems, and developed an online platform for forecasting. This was found to be effective in highlighting to farmers the probability of seasonal forecasts through a people-centred approach.

Batlhalifi Nkgothoe then presented his PhD research on indigenous pastoral practices for food system sustainability. Cognisant of not only the issues with the relegation of Global South knowledge to the periphery by Western hegemony, and the unsustainability of agriculture, this study conceives of alternatives to be found in plural approaches. This study imagines a co-created alternative pathway by engaging what already exists within indigenous communities. In

a similar vein, Dr Noel Ndumeya's presentation explored an ethnographic study of climate change perceptions in Northern Lesotho. Critical of the documentary nature of most historical analysis, this study conducted interviews to evaluate oral histories of rainfall, snow, wetlands, springs, temperatures, and dams in the region. From this, it was found that there was a lot of nostalgia for the 1950s-1970s and memories of animals, greenery, harvests, and snow in June/July. In contrast, a change was noticed around the late 1980s to mid-1990s of less rainfall, more destructive rainfall, snow only in high-lying areas, and dried wetlands, springs, and dams. Correspondingly was a shift to more resilient crops, use of greenhouses, and migration to adapt.

Session 2: Direct impacts of climate change

The first session began with Professor Jennifer Fitchett, in which she presented a critical analysis of the reliability of tourist questionnaires in determining temperature thresholds for tourism climate indices. Her study compared the perceived temperatures and thermal comfort levels reported by tourists against actual measured values. The results of the study highlighted significant discrepancies between perceived and measured temperatures. It was found that a mere 19.9% of the respondents could accurately estimate the temperatures within a close range of 1°C of the actual recorded values. Professor Fitchett concluded that these findings cast doubt on the efficacy of utilizing self-reported temperature thresholds in the development of tourism climate indices.

Dr Jessica Steinkopf then addressed the critical role of the El Niño Southern Oscillation (ENSO) in influencing global weather patterns, particularly its established effect on rainfall variability in Africa and southern Africa. She emphasized the importance of understanding ENSO's future impact on rainfall amid climate change. Her findings are significant in enhancing our comprehension of potential shifts in ENSO's impact on rainfall in this water-scarce region due to climate change.

Last in this session, Dr. Raeesa Moolla provided an insightful analysis of the socio-economic effects of tropical cyclones on Southern Africa's low-income populations. She highlighted the crucial function of social media in spreading critical information, rallying community action, and managing resources, which collectively bolster community resilience in the face of such disasters. Her study advocates for strategic actions by governments and non-governmental organizations to maximize social media benefits for disaster readiness and response, providing key recommendations for policy developers and humanitarian agencies.

Session 3: Gender and climate change

The third session covered research being carried out at the Southern Centre for Inequality Studies. The first presentation by Sonia Phalatse focused on the development of a care-climate nexus. The presentation proposed a conceptual framework which recognises the undervaluation of care and nature by structural (such as socio-political contexts and gender) and intermediate determinants (such as the models governing energy and agriculture) which drive the effects of climate change both socially and environmentally, resulting in an increased need for care. Cognisance of this framework would have policy implications that decentre technological solutions (and its marginalisation of workers, for example) and the economy, and prioritise a systemic approach which centres on care in climate policy.

Julia Taylor and Katrina Lehmann-Grube then presented on the topic of a gender just transition. Using examples of gender injustices in transition, they argue that gender just transition should recognise that the climate crisis is created by the same systems producing gender inequalities. It should prioritise care, social reproduction, access to resources, intersectionality, knowledge creation, and alternative approaches to measurement of wellbeing. This is based on four types of justice: distributive justice giving equal access to women; participatory justice allowing those marginalised to partake in inclusive ways; recognitional justice appreciating insights which already exist; and restorative justice acknowledging past harms and redressing them.

Session 4: Health in the context of climate change

This session began with a presentation of Naeema Ahmad Ramadan Hussien El Kout's work on developing assistive devices for disabled people using recycled plastic. This was proposed as filling a gap in poor access to assistive devices for economic reasons (resulting in social and economic exclusion) and the large amounts of plastic waste accumulating. The hope is that this would be integrated into policies such as the National Health Insurance and economic models such as local hubs where they could be hired.

Mukhtaar Waja presented his PhD research which aims to analyse various studies into climate change and mental health to evaluate how thorough these studies are. With mental health, this is especially important to analyse because there is often a lag between climate events and mental health issues which may not be accounted for simple correlations which do not properly establish causality.

The last presentation was by PhD student Nyameka Spambo, evaluating the psychological impacts of disasters, particularly the 2022 and 2024 floods in KwaZulu-Natal. The analysis was aware of economic factors influencing psychological impacts, finding that race influences access to mental health services. This necessitates rural community-specific post-disaster interventions for mental health issues arising from stress, death, and injury.

Day 2 – 1 August

Panel on Fossil Fuels in Developing Countries

This panel, facilitated by Professor Imraan Valodia, represented a variety of Wits University experts including Professor Lucy Allais, Professor Thokozani Majozi, Professor Francois Engelbrecht, Associate Professor Samson Bada, and Associate Professor Glen Nwaila. The key question under consideration was what developing countries should do with their fossil fuel deposits when developed countries were able to industrialise using fossil fuels and afford to make a transition, while developing countries may face the dual issue of an energy crisis and climate change impacts.

The panel differed in their perspectives on this matter. Professor Allais took a philosophical approach which emphasised that whether it is fair or not for developing countries to use fossil fuels to develop, what should prevail is the moral imperative to not worsen the climate crisis and localised negative health impacts when a just transition that includes reduced fossil fuel use is possible and where practical measures such as rapid investment in developing technology, carbon debts, and a non-proliferation treaty may help introduce equity and cooperation.

Professor Majozi suggested that technological advancement could make the responsible continued use of fossil fuels more efficient. This pragmatic approach would thus invest in minimising the impact of the perhaps inevitable use of fossil fuels. In a similar vein, Associate Professor Bada highlighted the high dependence on fossil fuels that is present, especially because of its low cost, reliability, and accessibility. Saying that green technology is not really green, he also advocated for an approach centred on developing technology to minimise the impact of the perhaps inevitable use of fossil fuels.

In contrast, reiterating his earlier assessment of the risks of climate change, Professor Engelbrecht asserted that survival requires that coal is phased out by 2050, not only in South Africa, but everywhere, indicating that even clean coal investments do not make sense. Professor Engelbrecht highlighted that investment should be targeted at improving the transmission grid. This was followed by Associate Professor Nwaila's exploration of some trends in renewable energy, showing its growth, and its increasing reliability, affordability, and safety. Finally, he identified opportunities for growth in investing in finding energy storage solutions, looking at various types of hydrogen, using wind where it is naturally abundant, and recognising the opportunities for solar and geothermal energy in South Africa.

Session 1: Climate change research in the Humanities

This session began with Professor Andrew Thatcher's presentation of constructed wetlands to treat grey water in the Silvertown transit camp on the Jukskei River in Johannesburg. Raised constructed wetlands were built as a solution to greywater disposal challenges. This was seen to be successful, especially in centring a participatory approach. However, there has been significant sludge buildup due to heavy use and microplastics which is yet to be solved. Also on water, Professor Emeritus Isabel Hofmeyr and Professor Sarah Nuttall, presented their "Reading for Water" literary project, tracing the descriptions and interpretations of water in South African literature. This revealed different ways in which water is understood by people, including indigenous people relating to water in spiritual ways. They further emphasised how water transcends areas and borders, requiring a larger metaphysical and imaginative view of water.

The third presentation by Dr Presha Ramsarup focused on the development of practical learning pathways for green jobs and implications for work, education, and training systems. She revealed three possible pathways leading to green jobs: the labour market demand for that job, education leading to that job, and external factors such as climate change driving that job. The fourth presentation by Dr Paul Goldschagg evaluated the relationship between noise pollution and climate change, finding that many sources of noise (such as construction and industry) also contribute to climate change by emitting greenhouse gases. In recognising this relationship, interventions with dual impacts could be promoted. These include increasing vegetation to reduce noise and absorb carbon dioxide, and sealing buildings to keep out noise and preserve temperatures, reducing the amount of energy for heating or cooling.

The final presentation by PhD student Tendai Ganduri explored debates of land politics and climate change by exploring digital conversations on X (formerly Twitter) focused on South Africa and Zimbabwe. Her finding was that people do perceive land politics to relate to their livelihoods and climate change. While there is consensus on the reality of climate change across all groups, there are differences in perceptions of what the causes are and what can be done to address it, with actors more driven by economic implications.

Session 2: Environmental policy and governance

Dr Kingsley Ikechukwu Okere presented his quantitative analysis of the relationship between natural resource rent as a share of GDP, employment dynamics, and the consumption of renewable energy in Africa. The study recommended allocating natural resource earnings to developing renewable energy and developing and applying policy conducive to the growth of renewable energy, creating green jobs in the agriculture and service sectors, and encouraging industry to adopt more green technologies.

The second presentation by Associate Professor Chevonne Reynolds considered how income disparities in urban areas may manifest in landscapes. She evaluated the luxury effect whereby

there exists a correlation between higher biodiversity and higher income. In Johannesburg, not only was this observed but in a study of solitary bees, a linear model was found to strongly indicate where bees would be more numerous, based on income, due to access to floral resources. This was followed by the final presentation by PhD student Marius Muller who highlighted the importance of integrating environmental and social considerations in governance, alongside the role of capital in good governance. As such, he asserted that policy and accountability may be the key components necessary for ethical governance.

Sustainability strategy update

In closing, ahead of the keynote lecture, Professor Imraan Valodia, Pro Vice-Chancellor for Climate, Sustainability, and Inequality, delivered an update on the university's sustainability strategy alongside Julia Taylor. They introduced the sustainability strategy, committing the university to furthering the just transition towards net zero by 2050. The Sustainability Strategy outlines 6 key areas of intervention to reach this vision:

- Research and teaching: Research and teaching experience at Wits will inform the implementation of the strategy and guide future planning, curriculum development and research activities.
- Energy: By 2050, through a full range of on- and off-site technologies and strategic partnerships, Wits will have net zero-carbon emissions and will have justly transitioned using a combination of diversified, sustainable, green and renewable technologies providing reliable energy supply and usage that has minimal impact on the environment.
- Water: By 2050, Wits will improve its water consumption efficiency whilst reducing its reliance on fresh municipal supply by transitioning to water recyclying and treatment, rainwater harvesting and boreholes.
- Waste: By 2050, Wits will have minimised waste to landfill. Wits will ensure a reduction in waste, through an integrated campus approach to reuse and recycle as much as possible, minimise food waste and, where appropriate, support local waste reclaimers and businesses in our community.
- Transport: By 2050, most University vehicles transporting students will have been replaced by green energy vehicles by developing partnerships with donors and industry. Green charging stations will be available on all campuses for all electric vehicles. All campuses will be bicycle and pedestrian friendly with safe storage. The transport policies of the university need to be reviewed to include strategies to reduce carbon emissions.
- Procurement and infrastructure: By 2050, all systems must work towards the fulfilment of the strategy. Procurement systems and infrastructure plans must prioritise sustainable principles which include transparency, including the treatment and creation of a green campus, with green roofs, water capture, planting with indigenous species and food gardens. Ethical procurement is essential. Sustainable products should be used and green building codes should be applied to all renovations and new installations.

Professor Valodia provided updates on the Sustainability Committee's activity towards the target. Existing efforts under the strategy include identifying suitable rooftops for photovoltaic (PV) systems and installing them, promoting recycling initiatives such as additional sorting bins and

reverse vending machines, the provision of solar powered benches, the expansion of boreholes, improved efficiency of irrigation through rain sensors and timed irrigation, and obtaining an electric bus fleet and provisions for charging stations. There are currently 11 PV installations on campus with a capacity of 1064 kWp, with an additional 800 kWp planned for 2024.

This update was followed by some discussion which provided Professor Valodia with some further avenues to explore with the committee. Issues raised related to food gardens, engagement with stakeholders in the city, divestment from fossil fuels, indirect sources of emissions, and student involvement.

Keynote Lecture: Professor David McDermott Hughes
'Solar socialism: Wind, sunlight, and the paradox of abundance'

In his keynote address, Professor David Hughes delved into the synergy between renewable energy and social justice, emphasizing the negligible marginal cost and the boundless availability of renewable resources. He highlighted the importance of facilitating energy access in informal communities and fostering a participatory role for individuals in the energy sector's evolution. Professor Hughes advocated for localized and decentralized initiatives to bolster societal engagement. He also examined the unique challenges and prospects of South Africa's shift towards renewables, suggesting that worker-owned pension funds could play a pivotal role in financing this sector. He critiqued the prevalent scarcity mindset within the energy industry, which he believes impedes the full utilization of renewables.

Highlighting solar energy's untapped potential, he pointed out opportunities in underused areas such as parking lots and shopping centres, given the durability of solar panels. He proposed the concept of a 'wind commons' to cultivate a collective investment in South Africa's energy future. Furthermore, Professor Hughes recommended a practical energy transition strategy that favours social distribution methods over market-driven models, with a focus on protecting those most susceptible to climate change. This strategy includes ensuring the continuity of hospital power supply by deploying solar-powered refrigeration for community medical needs in emergencies.

The concept of "solar socialism" that was proposed suggests a model where electricity is produced locally through small-scale projects spread across communities. Despite its community-centric approach, there is a challenge to sustainability by the accumulation of wealth and power within a few large-scale enterprises. Professor David Hughes concluded by advocating for a balanced approach to climate change, emphasizing the need for widespread support to phase out fossil fuels effectively. This middle path seeks to harmonize local energy production with broader efforts to address the environmental impacts of energy consumption.

Symposium Programme

31 July 2024

Time	Activity	Facilitator
9:00 – 10:00	**Opening** • Welcome by Ruksana Osman, Deputy Vice-Chancellor at Wits University • Francois Engelbrecht - Dawn of the era of 1.5 °C of global warming: implications for southern Africa	Imraan Valodia
10:00 – 11:30	**Session 1: Sustainable agriculture and socioecological relationships** • The resilience of smallholder irrigation schemes in Zimbabwe by Michael Tafadzwa Nyamajiwa • Co-production of seasonal forecasting to support farmers' decision-making in the Western Cape by Ammaarah Darsot • Towards an African Food System of the future: Exploring Sustainable Indigenous Pastoral practices for Food System transformation by Batlhalifi Nkgothoe • Climate change adaptations among the peasant farming communities in Lesotho, 2000 – 2020 by Noel Ndumeya Q&A (30 mins)	Geoffrey Simate
11:30 – 11:45	Tea Break	
11:45 – 12:30	**Session 2: Direct impacts of climate change** • Exploring the Difference between Perceived and Measured Temperature by Jennifer Fitchett • The El Niño-Southern Oscillation teleconnection to southern African rainfall in a changing climate by Jessica Steinkopf • The Socio-economic impacts of tropical cyclones in low-income communities in Southern Africa – The role of social media in information-gathering and dissemination by Raeesa Moolla Q&A (15 mins)	Francois Engelbrecht
12:30 – 13:30	Lunch	
13:30 – 14:15	**Session 3: Gender and climate change** • The Climate-Care nexus - Sonia Phalatse • Gender just transition – Julia Taylor and Katrina Lehmann-Grube Q&A (15 mins)	Imraan Valodia
14:15 – 16:00	**Session 4: Health in the context of climate change** • Critically Examining the Data and Methods Used to Quantify the Impact of Climate on Human Health in Biometeorological Research by Mukhtaar Waja	Maria Papathanasopoulos

	• Critical reflection of the 2022 floods in KwaZulu Natal: A case of psychological effects of floods on black Africans from rural areas located in the south of Durban, South Africa by Nyameka Mbonambi • Investigating the Feasibility of Recycled Plastic-Based Assistive Devices for People with Disabilities in South Africa: An exploratory protocol by Naeema Ahmad Ramadan Hussein El Kout Q&A (30mins)	

1 August 2024

Time	Activity	Facilitator
9:00 – 9:15	**Opening: Welcome presentation by Imraan Valodia**	
9:15 – 10:30	**Panel debate: Climate change, fossil fuels and development: what should developing countries do about their fossil fuel deposits?** Panellists: • Thokozani Majozi • Samson Bada • Glen Nwaila • Lucy Allais • Francois Engelbrecht	Imraan Valodia
10:30 – 12:15	**Session 1: Climate change research in Humanities** • Behavioural assessment of a nature-based greywater treatment system in a dynamic urban informal settlement by Andrew Thatcher • Isabel Hofmeyr and Sarah Nuttall – Reading for Water Project • An Expanded Methodological View on Learning Pathways into energy jobs: A Critical Realist Perspective by Presha Ramsarup • Revealing the hidden connection between noise pollution and climate change by Paul Goldschagg • Climate change, chaos, contexts, chaos and hope by Tendai Ganduri Q&A (15 mins)	Victor de Andrade
12:15 – 13:30	Lunch Student poster sessions	
13:30 – 14:45	**Session 2: Environmental policy and governance** • Striding towards a greener future: Unlocking the potential of natural resources and employment dynamics in green energy transition in Southern Africa by Kingsley Ikechukwu Okere • The Luxury Effect drives the abundance of pollinators across multiple spatial scales in a large African city by Chevonne Reynolds • Ethical Governance: No Smoke, Only Mirrors by Marius H Muller Q&A (30 mins)	Tinashe Chuchu
14:45 – 16:00	**Sustainability strategy updates and closing remarks**	Imraan Valodia

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16:00 – 16:30	**Change venue over to Senate Room for Keynote**	
16:30 – 18:00	**Keynote lecture by Prof David McDermott Hughes: Solar socialism- Wind, sunlight, and the paradox of abundance** Drinks and snacks to be provided after the session.	Imraan Valodia