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Special SFSA Plenary Debate: 'The future of transdisciplinarity: How do we relearn to be human in new ways?'

This Structured Conversation took place among Dr Mamphela Ramphela, Prof. Coleen Vogel and Prof. Daya Reddy. Dr Ramphela was invited to deliver a Plenary address at the Science Forum South Africa 2020. Her address was followed by a response from Prof. Vogel, and the discussion was moderated by Prof. Reddy.

Mamphela Ramphela: The coronavirus pandemic has changed the world irreversibly. Evidence from those working across the globe suggests that this coronavirus pandemic may just be a dress rehearsal. Major disruptions are likely to continue due to the cumulative impact of our relentless behaviour that is breaching planetary boundaries. We would do well to harvest the lessons of this pandemic to learn to find new ways of being human.

I would like to explore three things here. First, how to emerge from the planetary emergencies that are upon us? Second, what tools can we use to reimagine a new reality? And third, how might we benefit from Africa's wisdom of a holistic understanding of our place on this living earth?

To the first. The beginning of wisdom is acknowledgement. Humanity has yet to fully acknowledge the dire situation we are in. Global warming is accelerating – the critical marker of 1.5 °C is more likely to be reached in 2030 than in 2050.^{1,2} The upper Paris Agreement boundary of 2 °C is likely to be reached before 2050, despite whatever actions we take, unless such actions are drastic.¹ Humanity is all but committed to climate change becoming more dangerous, and in some respects, irreversible. For example, the irreversible melting of the Greenland Ice Sheet may be triggered somewhere between 1.5 °C and 2 °C of global warming. Short-term action is crucial. What we do now, before 2030, matters. What is needed to curb global warming, is the drastic reduction of CO₂ emissions by 45% by 2030, with net zero emissions to be achieved by 2050.² This challenge is immense, but if achieved, the chances are excellent for restricting global warming below 2 °C, thereby avoiding many (but not all) of the most dangerous impacts of climate change.

These effects on our climate are consequences of our way of life as a human race. We have tended to be extractive and degenerative in our use of earth's resources, and our relationships with other forms of life. Biodiversity and ecosystems have been compromised, leading to the unleashing of previously unknown viruses, such as we have seen recently. There are multiple and interlinked tipping points that are challenging us to embrace the interconnectedness and interdependence of the earth as a living system. Our role in earth's living system – as the newest arrivals – needs to be tempered by humility and openness to learn from millions of years of nature's intelligence. Dee Hock who is the founder and Emeritus CEO of VISA observed that there is an ingrained, unconscious way of thinking that forms the deepest barrier to the urgently needed transformation of our world. Deep in most of us, below our awareness, indelibly implanted there by three centuries of the Industrial Age is the mechanistic separatist cause-and-effect command-and-control machine model of reality. It is remarkable that even as we speak of the 21st-century innovations, we speak of them as part of the Fourth Industrial Revolution. This industrial model of thinking persists, despite abundant evidence of non-industrial, non-mechanistic reality around us that speaks to the interconnectedness that we have referred. It is this deep unconscious mindset that exists also in academia, perpetuating the silences that undermine our scholarship. These silos make it difficult to work across boundaries of disciplines and fields of study. Multidisciplinarity, let alone transdisciplinarity, requires us to let down the high mental walls behind which we continue to work wholly in isolation from one another. Human social nature, and all its disciplines, are inextricably linked. Adherence to disciplinary silos robs us of the opportunity to innovate at the margins, at the threshold of every aspect of life, where the greatest innovation impetus lies.

To the second point. What tools can we use to reimagine a new reality in academia? Emergence from these emergencies that we have described requires us to bid goodbye to linear thinking. Mother earth's life-giving processes and the complexity of the web of life needs to inform our thinking. This requires a willingness to explore being human in a different way.

Donella Meadows, who, as lead author of the 1972 Club of Rome's report entitled *The Limits to Growth*³, encourages us to dance with systems. Her life's work taught her that we cannot control, or even completely figure out, the complex systems of the world: but we can dance with them. Dance is an important tool because it is an invitation to cross thresholds, and then greet and engage all parties. Dance is a tool that teaches us to first learn the beat and watch how the system behaves, before you jump in. As Africans, we have musical rhythm ingrained into our genetic makeup. Just watch a little toddler barely able to stand; as soon as there is music, they dance – automatically – to the beat, without any coach. This is inbuilt in us: the capacity to dance with a system. Meadows calls for us to see beyond the disciplines, to apprehend the wholeness of systems and learn from them. Transdisciplinary work requires expanding one's thought horizons beyond being academically correct. It requires a commitment to working with others across the boundary, getting into collaborative learning modes, admitting ignorance and being willing to be taught by others, and by the system being explored. The question is whether you, as practitioners of academia, are prepared to take the risk of defying disciplinary boundaries. Are you willing to engage the excitement of working at the margins? You need to explore and acknowledge where your fears about the risks of transdisciplinarity lie. Leen Gorissen, another scientist, points the way in her latest book, *Natural Intelligence*⁴, that the whole is greater than the sum of its parts. In science we call this phenomenon 'emergent



properties', which are entirely unexpected and can only arise from collaborative functioning of the system, but do not belong to any one part or individual of that system.

So, climate change and other planetary emergencies upon us, cannot be tackled within disciplinary boundaries. It is only by being willing to work across the threshold that possibilities open. Are we ready to cross? It is clear that climate change is one of the wicked problems we have created by disrespecting planetary boundaries. Climate change cannot be fixed by technological means – it requires a new way of thinking about who we are, what we do and what we value most in life, and how we relate to one another and to all of life in the living earth system. A fundamental change that is required is acknowledging that we are part of nature and inextricably linked to all living beings in an existential interdependence. What is remarkable is how scientists the world over are now turning to African wisdom for answers to the complexities of life. African wisdom has been carried to many parts of the world by the ancients of indigenous people who migrated to Asia, the Americas, Australia, and the island states. Indigenous wisdom about the interconnectedness and interdependence of all living beings is being drawn upon by biologists, evolutionary scientists, and more, to shed light on the relational dimensions of living. Ironically, this turning to African wisdom is often done without conscious acknowledgement that Africa is not only the cradle of humanity, but also the cradle of human civilization. For example, the same progressive Gorissen talks about the native society which endured for centuries, with little increase in the capacity to receive, utilise, store, transform, or transmit information, and had little time to develop a very high ratio or had time to develop a very high ratio of understanding and wisdom of data and information. They may not have known a great deal by today's standards, but they understood a very great deal about what they did know. They were enormously wise in relation to the extent to which they were informed and their information was conditioned by a high ratio of social, economic, and spiritual.

It is extraordinary that such a great scholar does not know, nor acknowledge, that the capacity to receive, utilise, store, transform and transmit information was in existence in Africa thousands of years before any other part of the world. Extensive documented evidence of Africa's civilisation prior to colonisation has been captured by scholars, like the Senegalese polymath Cheikh Anta Diop. Another scholar, Elisabet Sahtouris, an evolutionary biologist, in her book *Earthdance*, falls into the same trap by saying that the best life insurance for any species in an ecosystem is to contribute usefully to sustaining the lives of other species – a lesson, she says, we are only now beginning to learn as humanity. No, the 'we' that she's using is very wrong because people like me, who have learned from our ancient ancestors, knew this all along. That's how we were brought up. So the universal 'we' needs to be transformed into a pluriversal 'we', which consists of an understanding that context matters, that there are other ways in which we, as a people, should be looking at the world and understanding that we need to learn what we don't know, rather than pursue.

The tools we require to emerge from the multiple planetary emergencies we are facing are at hand. We need to shift our gaze from the narrow focus of disciplinary boundaries, to see the immense possibilities at the margins of time and space. We also need to draw on our rich African cultural heritage and wisdom and start actively dancing with systems. So, I want to invite you to leverage Africa's wisdom to learn anew how to be human. And those lessons would mean that we, as African scholars, who do intentional work and answer the question of why, are the strongest African Studies Centres, not in Africa, but elsewhere. Second, why are we not using the opportunity of linking with the diaspora, the African diaspora, to be able to leverage their exposure to other worlds so that we can create this incredible, strong African scholarship that is pluralist. Third, we need to actively challenge the Euro-American dominance and the so-called 'universality' and link with Asia, with Latin America, with other parts of the world, to surface a new scholarship that pays homage to interdependence and interconnectedness. Finally, we need to commit to stop teaching orthodoxy in the humanities and social science disciplines, particularly with reference to history, economics and religion. Orthodoxy in our education system is undermining the future of young

people in a world that calls for the ability to ask difficult questions. We need to relearn how to be more effective facilitators of self-liberating learning and stimulation of young minds to enable them to engage in the dance with complex systems. Young people need to develop a more acute consciousness of the heritage of the wisdom of their ancestors as a rock on which to build the reimagined futures they desire.

Daya Reddy: I might have at the beginning of our conversation reminded us all of a textbook definition of transdisciplinarity. I'm pleased I didn't do so: we've just heard from you a refreshing and insightful set of views. Firstly, on the stark realities that are facing us, what might be our knee-jerk response, namely, narrow disciplinary approaches to addressing these problems, whether COVID or whatever else it might be. Secondly, compelling arguments for going beyond disciplines, and not just within the context of scholarship. Also, connecting with people, connecting with societies, which is really what transdisciplinarity is all about. And thirdly, you have offered us some beautiful perspectives on what we as experts can learn from what might define a society, and the notion of wisdom residing within. We will come back to many of these points later on.

Coleen Vogel: Dr Ramphela noted in her opening comments a key issue for those engaged in sustainability and in fact for all those interested in enhancing sustainability. She noted:

So, climate change and other planetary emergencies upon us, cannot be tackled within disciplinary boundaries. It is only by being willing to work across the threshold that possibilities open. Are we ready to cross? It is clear that climate change is one of the wicked problems we have created by disrespecting planetary boundaries. Climate change cannot be fixed by technological means – it requires a new way of thinking about who we are, what we do and what we value most in life, and how we relate to one another and to all of life in the living earth system. A fundamental change that is required is acknowledging that we are part of nature and inextricably linked to all living beings in an existential interdependence. What is remarkable is how scientists the world over are now turning to African wisdom for answers to the complexities of life.

As a respondent to this input and given that the idea here is to trigger further debates and not to write a full paper, I therefore couch my comments within a brief overview of transdisciplinarity and some of the issues that are beginning to surface in South Africa. I limit my inputs to some of the pressing issues raised here but urge readers to read more widely and deeply and indeed promote a deeper interrogation of how transdisciplinary approaches can best be used in designing sustainable pathways moving forward. Clearly the context in which we are working in South Africa requires a much more nuanced and deeper introspection, focusing on the collective trauma⁵ that we have all been through, not least with apartheid but more recently with State Capture and COVID.

There is a need for deeper engagements into what has brought us to these situations⁵, e.g. *relearning how to be and become will require much more social or psychological understanding of learning and re-learning to which the brief intervention here cannot do full justice*. Such interrogation and reflection cannot be fully addressed here and in fact may require several entire journal series dedicated to such an activity.

One approach, that I can briefly raise here, that is being increasingly focused on and is mentioned by Dr Ramphela, is the need to cross boundaries and indeed ways of thinking.^{6,7} In describing transdisciplinarity as an educative process, the process required is about imagining and creating, as Dr Ramphela mentioned, new integrative knowledges to address the complex problems of the world.⁸⁻¹⁰ These approaches and processes, however, require detailed attention to methods, constructs and framings^{11,12} and indeed careful assessment of local contexts and contradictions, and careful and reflexive considerations of where we have come from.⁵



Transdisciplinarity, however, is not for everything and everybody. Dr Ramphela asked us if we are brave enough as scholars to do transdisciplinarity meaningfully, to inspire new thinking and offer novel solutions to old and new challenges. I am not sure we have been brave enough. Nevertheless, transdisciplinarity can create the spaces to ask the questions, and often it is articulating the question that is more important than finding the right answer. We need to give attention to what is currently not visible, what seems impossible to talk about. In South Africa, we are struggling to talk to each other. What is absent in the various discussions? Often it is easy to put things out there and talk about the explicit problems facing us as society. But what lies underneath?

Finding out what lies underneath and indeed who should be contributing to various challenges is not an easy task. We need an inclusive 'middle ground' where we create a safe space to come together to speak, articulate, surface contradictions and work together on creating a useful process for deeper learning as well inclusive and in some cases 'transgressive' framings of what constitutes knowledge in the sustainability and other domains.^{10,13} When knowledge is forever open it has the potential to move in a range of outcomes – such an inclusive knowledge approach is not a linear model that requires 'shoving' knowledge into a pipeline (journal articles, academic silos) or 'throwing it over the university wall' once we've done our science and hoping society comes desperately to collect it. Rather it requires a careful, co-engagement with society at the very outset on issues and challenges and learning together that may indeed be contested and challenged (see several more detailed articles on such approaches, e.g. Lotz-Sisitka et al.¹⁰).

Dr Ramphela also mentioned, and I concur, that emergence is *held*, and that's hard to do because as a scientist you are usually funded by a funding organisation that wants outputs, they want monitoring and evaluation, and transdisciplinarity sometimes doesn't get you there, immediately. But more importantly, we need approaches where an inclusive logic is respected, and where tolerance in contradiction is acknowledged¹⁴ – if only we could have more of that in South Africa – where tolerance in contradiction can be explored.

I concur with the call to integrate African wisdom. Transdisciplinary approaches also engage with deeper perspectives on social change, including wisdom traditions, and not just indigenous knowledge. Amanda Lynch writes in her book with Siri Veland, *Urgency in the Anthropocene*^{15(p.135)}: 'Relational approaches that take seriously the need to engage Indigenous people in responding to global environmental crises cannot rely on existing formulae if committed to the common interest. Hence, rather than seeking to "translate" Indigenous myths or prescribe Indigenous policy participation, we may begin to accommodate the coexistence of paradoxical spaces of governance.'

It is not only just indigenous knowledge. It is imperative, as Dr Ramphela said, to understand, appreciate and, as she says, 'acknowledge', other epistemic cultures, originating from various historical, social and cultural backgrounds. Positivism is not enough: we cannot address the challenges we face with only certain kinds of science and scientific approaches. Indeed, transdisciplinarity is more than a method or even a practice. It is an adaptive capacity and a way of being. It is not a formulaic, hard-core science, or technocratic concern.⁷ These things are important, but when transdisciplinarity is taken as a way of being, the need for knowledge and know-how for integration and implementation extends far beyond the scope of research projects and appears constantly and ubiquitously in real life. We need not only the positivist scientists, but also the contemplative thinkers, literature artists, sculptors, design thinkers and many more.

There is a book called *Being Peace*, written by Thich Nhat Hanh, with a foreword – written in 2020 – from Jane Goodall.¹⁶ Goodall writes: 'As I write these words, we are living in dark times. Fortunately, there are many brave people fighting for peace and justice and an end to discrimination. Fighting the arrogance and the lust for power and wealth that is destroying the biodiversity and the natural resources of Planet Earth, dispossessing millions of people from their homelands. ...' To change the hearts of others, says Thich Nhat Hanh, we have to first change our own hearts. 'To suffer is not enough.'

Daya Reddy: The prefix 'co' has occurred at various places in both the contributions of Dr Ramphela and Prof. Vogel, whether co-operation, co-design in the context of disciplinarity, co-existing forms of knowledge, and the like. One question that I have concerns the picture one has, as you both pointed out. It is not a case of putting side by side these different communities – scientists and scholars on the one hand, and civil society and government on the other – but rather working towards a truly integrated view, and a completely synthesised approach to the problems that we face. What is it that remains for the community of scholars and I'm thinking of scientists, in particular, and here, by 'science' I'm referring to everything from the natural to the social sciences – what remains to be done, and I believe there is much to be done, with regard to proper public engagement? In other words, if we are going to have a truly integrated approach of the kind that you've both presented, what is our responsibility to ensure that the community, broadly speaking, has a good grip on what the science is about, and is able to contribute in that integrative way? With COVID-19, these issues are highlighted in very stark terms because it affects people's health and survival right now, and it affects people's livelihoods. We have over 70 million more people in extreme poverty around the world as a result. The role of science is so very evident in this particular case, but it applies to issues that go way beyond COVID-19.

Mamphela Ramphela: In answer to the question of what needs to change is an openness to learning every day of our lives. When we stop learning as human beings we die: we may not be physically dead, but we are spiritually dead. I want to take you back to Egypt, where our ancient ancestors, the scientists of that time, the people who figured out geometry, trigonometry, the mathematics, and the cosmology that enabled them to build the pyramids that are still standing today. Who were they? They were priests! From the very beginning of the human evolutionary process, science has always been integrated as a spiritual expression of who we are. The pyramids are configured in relation to the stars. This is why I disagree with Leen Gorissen that these ancient people did not have a way of documenting. They did. They invented writing. The first library, the Library of Alexandria, was miraculously and very strangely destroyed by fire. But in Ancient Greece there were students of these Egyptian priests who learned at their feet. Miraculously, Plato was able to write a thousand manuscripts in one year. How's that possible? I mean, you and I know how you sweat to get to one paper going. Now, to have a thousand, is really miraculous. If we want to engage in this new way of being, we need to be open to learning.

Second, we need to acknowledge that, as human beings, we are part of the web of life – the heart, the mind, the body need to remain integrated for us to function as individuals. Human beings are wired to be in relation to other things, and our relationship to nature is not to look after nature. No, we are part of nature. And acknowledging that enables us, again, like those Egyptian priests, to learn from nature, then to use the knowledge to be able to evolve into better educated and learned people. We are being pushed by this coronavirus pandemic and all the other emergencies, to think and *be* different.

Coleen Vogel: Those of us who work in transdisciplinarity are saying 'science with society'. And I know there is a whole series of things that come up in the wash, because of that, such as maintaining objectivity. I have been working with the City of Johannesburg to develop a climate action plan, and the youth have been given a set of inputs that they crafted. It requires building trust.

But, unfortunately, the scientists are telling us that we have only a limited time left if we are going to save the planet. So how do we now ramp this up much, much faster? And I do really think we need to learn from COVID. The scientific community is only thinking about policy, which is very critical – we need to get into policy, but we need to be doing practice, and more importantly, praxis – learning how to engage. The social movements are on the streets, and we need to find those intersections where science is made real.

Mamphela Ramphela: Education lays the foundation for the work, the lifelong work of learning. Our education systems should be how to facilitate the enablement of young people to learn how to learn and to ask the difficult questions. And yet, we are so focused on teaching individuals



specific things. That is why, in my view, we have such an appalling performance of our students in maths and science because we do not connect maths and science to real life. I learned maths and science in my final 2 years of Grade 12 because of Bantu education. I was able to get distinctions in those subjects because my teachers, who were very experienced teachers, connected the teaching of the basic principles of maths and science, to everyday life, and to concrete things.

I believe we need to part with the grammar school colonial discipline and hierarchical education models that were used, particularly in the light of the multi-generation of humiliation of the majority people in this country. The undoing of that requires integrated learning. There is one school system, called the Leap School System, that is practising this self-liberating education. The schools get 90% pass rates, and all the children are doing maths and science. There is no such thing that they are too poor to do mathematics. And, where do they come from? Alex, Diepsloot, Langa, Philippi. There is nothing, including poverty, that can prevent young people's geniuses being stimulated if they approach it the right way.

So, what is this approach? They teach around tables. Africa learned a long time ago that the best way of keeping this interconnectedness going, is eyeball to eyeball. And so, when you teach kids in life orientation, around the table, they become their own liberators. It's incredible! I really would like to encourage all academics to visit one Leap School in your environment and see, for yourself, that non-orthodox education is not only possible but might be the only way we can move forward.

Coleen Vogel: We certainly need the maths and the sciences. But I fear that we may go astray if we do not also stress the importance of the social sciences and the humanities. I have colleagues who are doing interesting work on what is called, not transformative, but transgressive research. In some areas we have to cross the boundary, we have to shake the tree, we have to stand up now and shake the system. But in this space where it's complex, with wicked challenges, I do think we need hard conversations.

Daya Reddy: The whole business of education has been touched on in a broad way. And we all, I think, lament the inertia in the university system. Despite embracing, at least in formal policies, multi- and transdisciplinarity, universities have difficulty in transcending these boundaries, these silos, many of which are deeply embedded in the bureaucracy and also in our ways of working. Multidisciplinary thinking should start at school level, and serious work is needed to inculcate broader approaches to education that are not hobbled by disciplinary constraints.

There is a university in Japan, the Okinawa Institute of Science and Technology (OIST), which was established through the efforts of Koji Omi, a former minister and the founder of the Science and Technology for Society Forum that takes place every year in Japan. At OIST there are no departments, no disciplinary boundaries. Whatever your degree programme, you enter, and you do a rotation, through the various areas, and eventually you work towards your project, definition, proposal and so on. It is a very novel concept, which can serve as a model for such initiatives at university level.

We've spent quite a bit of time talking about the set of issues in the context of transdisciplinarity. Referring to education in particular, there is a need for a fundamental transformation in the way in which we educate and the way in which learning takes place. It was said of a colleague that he 'crossed disciplinary boundaries without looking for oncoming traffic' – an admirable example.

The second issue here has to do with the integrative nature of transdisciplinarity. For it to work, almost by definition, it has to be an integrated 'whole'. For example, people and nature, not people versus nature, and we haven't even touched on the problems of biodiversity, science with society rather than science for society, and the number of

terms prefixed with 'co'. Furthermore, the scholarly community should take care not to adopt a patronising attitude in engaging with society. There is a great deal of work to be done. What has been indicated here is a sense that transdisciplinarity is a tough thing to get right. One can set out a good definition, but hearing from Dr Ramphele and Prof. Vogel, it's clear that it needs a really deep and fundamental change in the way of thinking about everything, about how we go about learning about the world, and how we go about solving our problems.

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