

Sustaining Africa's path to economic recovery by improving infrastructure through innovation and investment

TOPIC

Expanding the boundaries of engineering to co-create enduring infrastructure

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Purpose

Contextualising the topic

- We have a vested interest in the growth of our country – I will use the term ‘we’ meaning us a collective in South Africa
- We have an embarrassing GINI coefficient suggesting that the country has not made good on the damaging effects of our divided past – those that are vulnerable are increasing – those that can assist are duty-bound but may be diminishing in number.
- Many of us resolve to be actors, spectators, commentators, and analysers whilst having little to show by way of action/implementation that materially connects infrastructure spend growth to our social objectives – especially inequality and social justice which don’t appear to be important enough to give purpose to what we need to do
- Whilst we appear to know what to do in our singular roles – we may not have a full appreciation and care for the ever-increasing complexity of social circumstances in our country – it is no longer just about building infrastructure – we have to do it sustainably which is multidimensional. Significant innovation is required to embrace the complexity and not seek to simplify it to suit.
- The innovation I refer to is: HOW do we achieve multiple objectives in providing infrastructure? I don’t refer to technology in this context
- We must make a difference to those that depend on our leadership to improve the average quality of life in the country – we must lose sleep over the fact this is not happening effectively, if we don’t – history will write that this generation of leaders is to be blamed for stealing the future of our youth
- To have an event such as this must make a difference towards promoting concepts of sustainability as our current KPIs indicate that we are not sustainable – infrastructure can play a meaningful role to do so

▶ All solutions – Sustainable!

Infrastructure and the Economy

What is the impact that we should be aiming for to enable resiliency and growth?

- Highest quality of education in secondary and tertiary in literacy, mathematics and science – necessary to promote the building of a nation – meritocracy is important – it is not generally the case at the moment
- Capacity building and Skills development – engineers need to be professionally registered
- Professionalising of the public sector is key to capacity building, risk management, effective infrastructure planning, provision and maintenance – recently gazetted 26 March 2021 – ECSA’s Identification of Engineering Work affects us all – non-compliance will expose us all in terms of infrastructure risks – similar to the existing risks
- Private sector has to give meaningful effect to value creation, social mandates, exploitation, and ethical designs in accordance with ECSA code of conduct – greed and opportunism has to cease
- Depoliticising (within reason) infrastructure development – there is no line between technocrats and bureaucrats and roles are reversed in many cases – many people don’t know what they don’t know and act as if they do know
- Regulatory regime has to become pro-development – much work has to be done in treasury and auditor general to understand the dynamics of development and these are unknowingly constraining growth
- Government often has an arrogant strangled hold on development and will not allow innovation – our policy implementation is not working. If it was, we would not be talking about it
- Research and development have to be promoted more aggressively in the public sector – we train people and let them go
- Technical learning comes on the back of making mistakes – mistakes have to be allowed to learn within a controlled environment

► How infrastructure development assists economic recovery – theories are tested making ideology moot

- Development Theory – Economic Development is a process that generates economic, social & technical progress of nations – it serves as the basis to ensure the efficient allocation of resources to support GDP growth.
- Newer theories expand focus on socioeconomic, political and institutional factors that promote an improvement in the level of living, poverty reduction, reduction of income inequality between people in the country and violent crime.
- Structural reforms model (one of the many models) focuses on mechanisms to change the structure of a country like moving from agriculture to industrialisation which seems to touch on the phenomenon of urbanisation – all labour is absorbed into industrialisation projects around urban areas. This absorption of labour has not succeeded in the development of the pathways towards industrialisation except in China. In our case, people come to urban places hoping to find sustainable livelihoods – no opportunities for growth, education and employment that are guaranteed – hence we have so many vulnerable communities and informal settlements – it now amounts to social injustice. Communities expect these models should be implemented
- So we have the knowledge, we have the technology we have the need for development, we have the approaches, but we cannot make the link between economic policy, institutional arrangements and industrialisation – all whilst we quote China and Asian development stories with excuse based logic on why they are successful and we are not.
- We don't need to be the economic powerhouse of the world or the continent – we need to fix our home!
- Our disconnected development ideologies perpetuate a lacklustre development trajectory which seems likely to remain a stalemate likely to remain for a time to come

▶ We need to think differently and allow divergent thoughts

- We have pre-existing dispositions on many issues, many have dug their heels, others are open-minded, and there are many that just do not think. All hold us back as it does not contribute to alignment that would lead to progress
- Whether radical economic transformation or neo-liberal macro-economic ideologies are right or wrong is fast becoming a moot point as people on the ground may not actually care. The high regard for public sector leadership and trust is perhaps at its lowest and will be tested in 2024
- The Africa development story has to play out for us to succeed. Therefore political ideological debates have to stop and development has to commence. Time is no longer on our side and trust needs to grow in society.
 - We have talked about SDG9 and industrialisation for decades and how has that worked out whilst we are part of BRICS – for 6 years we are trying to build cars in Ngqura IDZ with not much to show for it as an example.
 - We have talked about skills and capacity for decades in a lacklustre academic landscape
 - We seem nonchalant about whether we have skills or not – yet it is a global issue and is the most recent threat/opportunity that management skills and talent.
- Neo-liberal macro-economic policy seems to have perpetuated neo-colonial dependence, false paradigms that we are okay and dualistic models that can only confuse ones leading the country – dissonance has given rise to the phenomenon of factions in our politics and is disconnecting public and private sector further
- Such dissonance prevents growth prospects, pursuing poor strategies, perpetuates imbalances and exposes us to ongoing exploitation – it does not matter who is in charge, our issues have become fundamental and will happen ongoing unless we stick to the basics of classical development theory

► Action Implementation

- What is the impact that we should be aiming for?
 - Highest quality of education in secondary and tertiary in literacy, mathematics and science – necessary to promote the building of a nation – meritocracy is important
 - Professionalising the public sector is key to capacity building, risk management, effective infrastructure planning, provision and maintenance
 - Sustainability is key and necessary – we have commissions – what have they done to date wrt impact – they need to work?
 - Private sector has to give meaningful effect to value creation, social mandates, exploitation, and ethical designs in accordance with the ECSA code of conduct – sustainability of clients and service providers has to purposefully managed
 - Depoliticising (within reason) infrastructure and allowing freedom of the leaders to lead
 - Remove ineffective and toxic leadership from core delivery entities – merit matters – toxic leaders contribute to organisational decay
 - Regulatory regime has to become pro-development – much work has to be done in treasury and auditor general
 - Research and development must be promoted aggressively
 - Technical learning comes on the back of making mistakes – mistakes have to be allowed to learn within a controlled space
 - Remove fear from teams and allow innovation to flourish
 - Creating and enabling environment allows for innovation to flow

Development pathway needs to be cleared

- Working against ourselves as we are not aligned on how we give effect a developmental state and makes easy things hard.
 - The effect of quality education is fundamental to a sustainable future – all levels
 - Government has to clarify its role in a developmental state. Currently no real business mindset and happily spend other people's money without consequence management. There have to be consequences for maleficence
 - PPP and similar models become unsuccessful as the both public and private sectors are not geared to close successfully. Even mature organisations behave immaturely – this approach is reactionary and opportunistic
 - Government has to know, understand and appreciate the role of the private sector. When the private sector is used to do the work of government we have doubled the cost of doing business – creating unnecessary inflation Both have distinct roles and can co-exist to a greater extent
 - As leaders we have to seek humility and abandon arrogance and ego – we all don't know all the answers – will enable meaningful conversations, create a learning environment, reduce dissonance and allow for convergence whilst promoting respect for the various role-players in the development journey
 - Effective leaders have to be able to bring value to a business holistically to ensure sustainability
 - We have to protect talent, grow talent and create an enabling environment to retain talent – talent has become a global commodity as we are seeing with South African talent
 - We need to design new methodologies to force a direct link between infrastructure and socio-economic development objectives – it can no longer be assumed that if we build or spend money we solve socio-economic issues, sustainably

New concepts

Co-created Solutions towards



Integrate our disciplines into a holistic value proposition motivated by achieving the goals of SDG 11 – Sustainable communities.

- I did mention the idea of economic growth and the need for structural changes to link economic growth to development which for our purposes means infrastructure planning, provision and maintenance – if we include technology we need to unpack SDG 9 which connects structural changes to industrialisation – our economy has to be a nett producer or exporter vs nett importer or consumer of finished goods. We have not progressed industrialisation into a general reality so we cannot speak of industrial inclusivity, the transformation of supply chains and the creation of new systems for both domestic and international consumption
- I made mention of disasters provoked by climate changes related to the intensity of storms – this means we have to include the constructs of climate change impacts into the solutions – we cannot design as we did in the past – codes need to be revised - SDG 13
- I made mention of the need for quality education – development of our own solutions, learning and teaching whilst we do projects. All projects have to have a learning component as current requirements have failed many years ago yet we proceed to be hopeful that it will succeed – SDG 4
- I spoke of trading partners that we have and maintain to keep locked into our economy – we have new markets opening with the AcFTA which is not gaining traction and we behave opportunistically when it comes to trading within our continent. It has to change towards strong partnerships – SDG 17

Segue of interdisciplinary objectives

Engineering Sustainability into Solutions

In summary, the segue of disciplines towards goals below, has the ability to move our plight, towards greater success, with a clear focus on :

- Social Dynamics – SDG 11 – plan with community needs in mind
- Economic Growth, Industrialisation and technology incl Innovation – SDG 9
- Climate change and its impacts on our country – SDG 13
- Geo-political partnerships – future market opportunities – SDG 17
- Education – capacity building and skills development – SDG 4

I did mention leadership attributes needed to support the scope of reforms required to transform South Africa towards sustainability. The current leadership (broadly public sector – private sector) will not work and perpetuates a downward spiral. Sadly we all lose if we continue – capable and effective leadership has to become the norm, not the exception

These disciplines have to be the new concepts to be integrated into planning, procurement, execution, operations and enabling environment

▶ Segue of interdisciplinary objectives

The segue of disciplines towards the goals mentioned means the following changes must happen

- Urban planning methodologies
 - We have to plan equitably
 - Sustainability concepts have to be integrated
- Public sector
 - Meritocracy has to be adopted into recruitment
 - Training and skills development methodologies need to be adjusted
 - Procurement has to align/promote socio-economic objectives and the practicalities of doing projects
 - Alignment of AG and project management realities
 - Integrated planning and the promotion of regional development – sharing of technologies to create win/wins
 - Incorporation of sustainability objectives regionally
 - Legal compliance to PFMA
- Academia
 - Revised / additional courses are driven by demand-side requirements – not only supply-side – aggressive promotion of the postgraduate study
 - Third stream revenue models have to be linked to current problem solutions – IP is not really IP if not commercialised.

▶ Segue of interdisciplinary objectives

The segue of disciplines towards the goals mentioned means the following changes must happen

- Financial investment and investment methodologies
 - Promotion of economic business cases – with new funding mechanisms
 - New integrated concepts into business case development – remember these were not the methodologies used when countries were first built
 - SDG 11 – also states the obligations of colonial entities to support development as current arrangements block change
 - Development can no longer support an elitist objective – public sector funds for public benefit – not to enrich a few
- Project Management
 - There is a need to revise the methodology to include learning and development, sharing project roles, addressing income wage disparities
 - Contracts need to be revised in terms of how to project cash flows within project roles players – sustainability must be a right afforded to all
 - Projects need to promote social cohesion, localise growth, promote sustainability and just adopt the current mechanical methodologies – it does not work in all cases
 - Stick to the plan – leaders feel they need to stick their name to their plan – please leave the ego at home before coming to the office
- Leadership
 - We need to develop a local leadership code of practice, incl. leadership attributes that all leaders have to subscribe to and be held accountable for when the public sector works with the private sector
 - Senior leaders need to work with social compacting, consultation, grow listening capabilities, empower teams to deliver, and emphasis the concept of time and alignment to the organisational goal / mandate

Equality and Social Justice as our key motivators

Engineering Boundaries Expanded

- We need to be reminded of the phenomenon of inequality which is currently being leveraged as a bargaining tool.
- Vulnerable people are deserving of the same rights and opportunities – improved lives will only happen if we all support this notion of egalitarianism
- Our blinkered vision often forgets why we do what we do wrt to infrastructure
 - Banks want ROI and a payback period
 - Contractors and engineering firms want bottom-line profit
 - SOEs have abandoned their previous developmental mandates toward the bottom-line focus
 - Public sector agencies want to pay the least for the best
- Who in the infrastructure story has a focus on what benefits are derived by the end-user – communities – So should we be really surprised that it does not connect?
- We have to expand our thinking to appreciate what our boundaries should be as a human race – I few do so we will think and act differently
- Our motivations have to be towards the greater good and not self-serving at all costs

Significance of time

Engineering Boundaries Expanded

Many critics will say that we have a young democracy – I maintain the concept of time is relative to the issue at hand

- Our ‘young democracy’ cannot be an excuse for why we don’t do our work fast
 - What do you say when a community does not have potable water for one week, a month or not at all?
 - What do you say to a hungry family that has not eaten because of unemployment?
 - Families have waited for homes for decades
 - What do you say to a mother that has lost a child due to gang violence, drug abuse and criminality?
- These are just some of the realities/circumstances that will not tolerate
 - We are planning to address crime
 - Please read our NDP 2050 – it shows how we will address unemployment
 - We want the private sector to assist with the development
 - We have plans in place to reform our economy structurally
 - We will deal with those that have stolen and continue to be corrupt
 - Load shedding will end in 6 months

Our plans have to fit the issue that is happening on the ground – infrastructure development provides immediate relief whilst we re-engineer the economy for sustainability in the medium to long term. Immediate issues have placed us in crisis mode with medium and long-term growth as academic arguments. **We cannot stay in crisis mode !**

Revisiting African infrastructure development ideologies

Engineering Boundaries Expanded

- Broaden our trading markets which brings additional economic growth on the back of increased trade – we have to work towards the following to give effect to AcFTA
 - Adoption of a business mindset to create regional wins/wins – there is still gearing on both sides
 - Reduce legislative barriers to market entry
 - Create the context within which technocrats can commence real integrated infrastructure planning – ports, freight rail and airlines
 - Develop plans that progress to increase revenues
 - Stop scoring own goals
 - Stop regional competition – we need to have a complementary mindset and work as a collective – the development agenda for Africa is huge and there is value for all stakeholders
 - Need to shift the leadership dial to greater effectiveness
 - Regional plans have to transcend individual country leaders/party politics and election cycles – too much volatility subject to ego-based leadership motivated by alternative agenda
 - Promote connecting people, cultures, tourism, and cultural exchange
 - People fix problems - if we can work as a collective we make meaningful progress

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Thank you

The impact of engineered solutions - Expanding the boundaries of engineering to co-create enduring infrastructure

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