A photograph of a waterfall cascading over rocks, with several large, smooth, grey and blue rocks in the foreground. The water is white and frothy. The background is a soft-focus view of the waterfall and surrounding greenery.

CREDO OF THE AFRICAN ENGINEER FOR A SUSTAINABLE FUTURE

**SEETELLA MAKHETHA
SAICE PRESIDENTIAL ADDRESS 2011**



About Seetella

Seetella Ntsibo Makhetha was born in Qacha's Nek in Lesotho where his father was a school teacher. He completed his schooling at Peka High School, also in Lesotho, in the mid-seventies.

Seetella received a scholarship from the Commonwealth Fund for Technical Cooperation to study civil engineering in India, where he graduated from the University of Roorkee in Roorkee, India, in the early eighties. He then read for his MSc in Civil Engineering from the University of Technology in Loughborough, in the UK, in 1985/6.

He subsequently worked for a number of institutions, including the World Bank sponsored Urban Development Project where he was involved with the design and testing of the Ventilated Improved Pit latrine. In his work, he was also involved in a number of water and waste water projects in Botswana, Tanzania, Malawi, Zimbabwe, Zambia, Kenya and Lesotho.

After working as the Senior Engineer at Maseru Water Supply, he joined the then Department of Water Affairs and Forestry in Mafikeng, and later worked for Stewart Scott as a water engineer. In 1992, Seetella and his wife Martha, who is also a civil engineer, started their own company in Johannesburg. They have since moved their head office to Port Elizabeth.

Seetella joined SAICE in 1989 and has served as Council member since 2000. He also served as chairman of the Membership Committee, and continues to play a vital role in membership affairs. He has written a number of articles on water supply and sanitation for developing communities, and presented papers on national and international conferences such as the World Water Conference, Water Engineering and Development Centre Conferences, and Africa San Conferences.

Seetella and Martha live in Port Elizabeth.



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The Credo of the African Engineer

*I am an engineer and in my profession I take deep pride.
To it I owe solemn obligations.*

*Since the origins of humanity on the continent of Africa, human
progress has been spurred by the engineering genius.*

*Engineers have made nature's vast resources of material and
energy usable for humanity's benefit. Engineers have vitalised, and
turned to practical use, the principles of science and the means of
technology. Were it not for this heritage of accumulated experience,
my efforts would be feeble.*

*As an engineer, I pledge to practise integrity and fair dealing,
tolerance and respect, and to uphold devotion to the standards
and the dignity of my profession, conscious always that my skill
carries with it the obligation to serve humanity by making the most
sustainable use of Earth's precious resources.*

*As an engineer I shall participate in none but honest enterprises.
When needed, my skill and knowledge shall be given without
reservation for the public good. In the performance of duty and in
fidelity to my profession, I shall give the utmost.*





Introduction

It is indeed an honour and privilege to deliver this presidential address and to accept the duties and obligations of President of SAICE for 2011. It is a duty to which I do not come unprepared. Past President Ali Naidu have prepared and coached me well and for that I am grateful. The staff of SAICE and especially our young and new Chief Executive, Manglin Pillay, have badgered me over the past several months regarding tonight's event. I am delighted that the preparation and planning are working so well.

Former South African President, Thabo Mbeki, started his first opening of parliament by reciting his famous "I am an African" speech. This immediately led to a reaction by all parliamentary speakers, including staunch members of the opposition, to proudly embrace their African-ness and to commit to the implication thereof. In beginning my address with this adaptation of the "Order of the Engineer" creed, which was first recited at a ceremony at Cleveland State University in June 1970, and which is modelled on the Canadian "Ritual of the Calling of the Engineer" initiated there in 1922, I hope to have a similar reaction to former President Mbeki's recital where all engineers who read, or hear this address, will proudly embrace our profession as engineers and undertake to serve the profession with utmost dignity, integrity and impeccable ethics.

I have decided to speak on the "Credo of the African Engineer for a Sustainable Future". As many of you know, it is not a new issue to our institution. It is a matter that past President Sam Amod raised several years ago following a visit he had made overseas.

In 2006, Sam Amod approached Baba Credo Mutwa to draft such a pledge. Sadly, despite Sam's strenuous efforts, Credo Mutwa's personal circumstances and fragile health impeded his contribution. I do not have the time to go through the entire history of this process, but I wish to state my conviction that the sincerity and morality that Sam Amod brought to this matter cannot be dismissed. Suffice it to say that it was not until 2010 that the matter again received attention from the Membership Committee.

It may be useful at this juncture to pause and reflect on the matter, so that we appreciate the momentous decision to create a credo for African engineers. A number of issues are involved.

Ethics

Ethics has been a subject matter within the scope of philosophers and is regarded as important for the few. Ethics, however, is anything but that. It involves everyday life choices by all living on this planet. It enables reflection on what we have done and what we wish to do. It enables us to reflect on whether we have acted for the good of others or in self interest.

Ethics has been defined as the rules or standards governing the conduct of a person or the members of a profession. The dictionary definition of a *profession* is a vocation or calling, involving some branch of advanced learning or a science. Ethics is the science of morals in human conduct.

Politicians have often misled citizens by stating that we live in a world of endless possibilities. They do not consider, however, that these endless possibilities are limited by the earth's inability to regenerate itself. To ensure ethical and sustainable development, it is our duty as engineers to constantly bring to the attention of politicians that, whilst possibilities are endless, our resources are not limitless.

Oaths

Many an engineer is known to swear on a construction site when things go wrong. These are not the oaths I wish to discuss. The oath I have in mind is a solemn declaration, or

undertaking for truth, or a commitment to a future action. As we explore Africa and Asia, we will discover that oaths, sworn by rulers, teachers or professionals on these continents were steeped in a spiritual knowledge of their Maker.

The Oath of Hippocrates is the oldest professional oath known in western history. It has been updated and adapted to be modern and applicable to our times and to the advances in the sciences. There are various types of oaths sharing core values which can be listed here:

- Oaths of Office undertaken before assuming duties of office
- Oaths of Allegiance
- Professions of faith by religious bodies

More specific examples include:

- The Scouts Promise and Law
- The Declaration of Sendai on Social Infrastructure and Civil Engineering Technology by the Japan Engineering Society
- The Thunderbird Oath of Honour
- The Harvard MBA Oath
- The South African School Pledge
- UKZN Pledge for first year law students

Three of these pledges call for further discussion, namely, The Declaration of Sendai on Social Infrastructure and Civil Engineering Technology by the Japan Engineering Society, The South African School Pledge and The UKZN Pledge.

The Declaration of Sendai on Social Infrastructure and Civil Engineering Technology by the Japan Engineering Society

In November 2000, the Japan Society of Engineers adopted what has since become known as the Declaration of Sendai on Social Infrastructure and Civil Engineering Technology. It contains the Society's philosophy, mission and strategies to enhance the welfare of society, and provides a pledge to enforce the Code of Ethics among civil engineering professionals. The declaration articulates three principles and five strategies.

The principles are:

- Harmonisation with nature and sustainable development
- Respect for regionality
- Respect for historical heritage and tradition

The strategies are:

- Communication and accountability to the public
- Clarification of vision and plans
- Introduction of the time management concept
- Fair evaluation and competition
- Technology improvement for infrastructure and development

The South African School Pledge

In February 2008 the National Department of Education began a public participation process to debate and agree on a pledge of allegiance to be recited daily by school children. The draft pledge contained elements of the preamble to the Constitution of South Africa. There will always be those opposed to new ideas and change and this particular pledge had its fair share of opposition and controversy and was subsequently not adopted. Two lines in the draft pledge caused considerable controversy. These were:

- recognising the injustices of our past, and
- honouring those who suffered and sacrificed for justice and freedom.

Some groups opposed these lines on the basis that it would instill a permanent guilt complex in school children. Other criticisms required references to God, while others centered around semantics rather than intention.

The positive intention was lost in the controversy surrounding it and South Africa missed an opportunity to grow a new generation of South Africans, united under a new Constitution, flag, anthem and pledge.

UKZN pledge for first year law students

More positively, the University of KwaZulu-Natal held its first pledge-swearing ceremony at the Howard College Theatre in February 2010. First year law students were led by Professor Reddi, Dean of the Faculty, in a pledge to, "...conduct themselves with decorum, respect fellow students and staff, and to act with integrity..." Afterwards the students received copies of the South African Constitution.

A credo shares values with all of these and is defined as a personal statement of belief and conviction.



Educating for Development

Educating young people to serve humanity includes the objective and value of internationality and seeing things in a global context.

Universities are instrumental in creating the highest knowledge, expertise and innovation. Universities must also ensure that knowledge and expertise promote the welfare, culture and sustainable development of surrounding society. Adhering to ethical principles, however, becomes increasingly difficult when faced with the realities of the working environment. It is in this area that learned societies can make a huge contribution by providing the impetus for morality and sustainability through the introduction of a credo.

At this juncture, I would like to take a personal moment to thank the Commonwealth Fund for Technical Cooperation (CFTC) for the scholarship that allowed me to study civil engineering. I thank also the government of Lesotho for organising the scholarship, and that of India and its citizens for their generosity and vision, in helping me qualify as a civil engineer.

The generosity of the citizens of India was demonstrated to my wife, Martha, and me in a personal way by the family of Mr Jai Singh Panwar, who, although he was a man of meager means working as a clerk in a government department, adopted us as his own children and provided a home for us in a place so far away from our home in South Africa. After becoming friends with his son, Mr Singh and his

family treated us as their own, and when, like all students occasionally do, we ran out of money, he provided for us just like he did for his own son who was studying with us.

That family is represented here by that same son, Mr Kushal Pal Singh, and his lovely wife Deepa who have flown all the way from India to be with us on this occasion. Memories of this kindness will stay with us all our lives and our links to India will remain strong. It is a kindness we can only repay by honouring the ethical and moral principles of shared international experience. Both Martha and I are products of this generosity.

It is during those dark days of apartheid when science, medical and technical education was being denied to black South Africans that several countries across the world opened their hearts and universities to black South Africans to study at institutions in their countries, sometimes displacing their own students to accommodate foreign students who were denied opportunities in the country of their birth.

Sustainable Development

At the World Summit in Rio de Janeiro in 1982, more than 120 countries signed the paradigm of "Sustainable Development". They agreed to develop in a sustainable way and to strive for the best possible combination of environmental, socio-cultural and economic goals, in their development achievements. The so-called triple bottom line of people (socio-culture), planet (environmental) and profit (economic) has to be aimed at and achieved, through



the creation of products, services, infrastructure, institutions and organisations, without losing sight of the long-term impact on the environment.

Without these sustainable considerations, northern corporates and governments exploit the mass markets of Africa, India and China. They pay no consideration to the fact that the exploited continents and countries cannot simply adopt the catastrophic lifestyles of industrialised countries. This results in unrecoverable consequences for our natural capital and social environment. Governments appear to be unable to control or restrict this kind of negative “globalisation”.

To develop solid and reputable national and continental engineering capacity, every nation on the continent needs to provide for planned and sustained engineering capability. To this end, in South Africa, ECSA (the Engineering Council of South Africa) has already identified four main areas of focus. These are:

- Upgrading of engineering lecturers, facilities and teaching
- Development of a national system of academic standards and accreditation procedures for international recognition
- The establishment and resourcing of a professional association for the engineering profession of technicians, technologists and engineers
- Fostering the development and identification of engineering work

Former SAICE President Trueman Goba identified sustainable development as a goal and challenge for the industry. This has presented opportunities to form partnerships with other voluntary associations and government departments under the vision of the New Partnership for Africa’s Development.

The Africa Engineers Forum (AEF), initiated by SAICE in 1995, is aimed at promoting and facilitating networking and liaison within Africa, through bilateral and multi-lateral cooperation agreements. The AEF has identified 26 key objectives based on eight key principles. These are:

- Exclusivity
- Transformation
- Transparency
- Responsibility
- Community Awareness
- Commitment
- Professionalism
- Networking

In March 2010 the AEF session, held in parallel to the Engineering Planet Future event, witnessed a formidable gathering of African engineers, committing to these key principles. During my term of office, it is my intention that the ideals of the AEF be operationalised to the extent that a challenging but achievable three-year programme of action is developed through SADC, and extended to other regional organisations on our continent.

Engineers are faced with finding a fine balance between development and sustainability. A quick and very visible example is the use of mobile phones and personal computers. In the past two decades the use and increasing digitisation of these two products have not only developed new service industries and created employment for hundreds of thousands of workers worldwide, but it has also shrunk the world by dramatically improving communication, so much so that every *Gogo* is now able to communicate with her children and relatives. These technical innovations have democratised access – be it registering to vote, or obtaining examination results.

This access increases individual freedom and creates a democracy of consumption. This product-based wellbeing, extended on a worldwide scale, is proving to be intrinsically unsustainable. It creates unsustainable expectations and demands on natural resources, which the planet simply cannot supply on an infinite basis.

It is therefore an ethical choice for engineers to provide enabling solutions that would allow people to acquire and maintain sustainable and balanced consumption of products that support a balanced lifestyle.

South Africa as a Developmental State

A society that wishes to implement policy for sustainable development is faced with the need to identify both the desired direction of change and the criteria which will determine its success. The paradigm of the developmental state is one which the South African government has accepted. It is the paradigm against which government's policies should be measured. It is, however, the ethical

framework that society uses to govern its relationship with all other life that will balance economic benefit and social and environmental impact.

Sustainable engineering then, is a process of using energy and resources at a rate that does not compromise the natural environment, or the ability of future generations to access these resources to meet their own needs. Hence there is a need to examine the policies that govern the actions of a developmental state.

Amartya Sen, in his work, *Development as Freedom*, states that "...development can be seen...as a process of expanding real freedoms that people enjoy..." (1999:3) He asserts that "...development requires the removal of major sources of unfreedom: poverty as well as tyranny, poor economic opportunities as well as social deprivation, neglect of public facilities as well as intolerance or over-activity of repressive states..."

In defining the South African concept of a developmental state, Sen's concept of removing poverty and tyranny is central. Expanding economic opportunities and fighting social deprivation are critical, and providing public facilities and services to the poor is paramount.

Fundamentally, the developmental state must balance the promotion of economic growth with social development. It must also balance investment such as human capital development in the long term with shorter-term investment in economic infrastructure.

Integrated Development Plans: Local Government and Development

The 1998 White Paper on Local Government from the Department of Provincial Affairs and Constitutional Development, defines developmental local government as being committed to working with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs, to eventually improve their quality of life.



In reforming local government and consolidating white towns with black townships, the then Department of Provincial and Local Government legislated for Integrated Development Plans (IDPs). Philip Harrison, Professor of Urban and Rural Planning at the University of the Witwatersrand, and member of the National Planning Commission, in his assessment of 2006, concluded that the IDPs have strengths, but also serious flaws as instruments for:

- Cooperative governance
- Participatory government
- Efficient administration
- Creativity and innovation, and
- As civil instruments of developmental local government

SAICE Infrastructure Report Card for South Africa

Following the resounding success of the *Infrastructure Report Card for South Africa* in 2006, SAICE will launch its latest Report Card within the next few months. The Report Card on the state of South Africa's infrastructure assigns grades to each of the infrastructure sectors such as water, sanitation, roads, railways and harbours, and so on. Infrastructure and its maintenance underpin quality of life and economic development. If infrastructure, new and old, and the operation and maintenance thereof are inadequate, it will impede social and economic growth in South Africa – something our country cannot afford.



Without pre-empting its findings, we are aware of government's attempts to address the apartheid deficit in infrastructure development in the townships. There are still many gaps in meeting the infrastructure needs of a growing South African economy. We can be justly proud of the stadia and road infrastructure we have built for the World Cup, and I have no doubt that we can match this capacity in building water networks, houses, clinics, hospitals, roads and highways in our country in the future and effectively implement operational and maintenance plans on our existing infrastructure, in a like manner.

An Ethical Leadership Approach to Public Service Delivery

Is government capable of combating and preventing fraud and corruption?

The effect of fraud and corruption is that it eats away at the tax collected from the public, in the process eating away at the moral fabric of society. In turn, corrupt practices result in non-delivery of essential public services, so denying communities their right to an improved standard of living.

JS Wessels and PC Pauw stated in 1999, in *Reflective public administration: Views from the south*, that public officials without personal morality and the necessary sense of public duty will either themselves be prone to abusing their positions or will fall prey to being abused by corrupt elements. Either way, the corruptor and the corrupted must be viewed in an equally serious light and brought to book.

Leaders and managers must lead and manage by example, as must engineers who have in the public eye a distinguished and honourable reputation. Their conduct and attitude must remain beyond reproach and above suspicion of selfishness in their service rendition to the public. Everyone in government, too, must pass this test to champion public service delivery. The public interest must supersede private and personal interest, if government is serious about turning service delivery around for the good of the public.

To this commendable end, SAICE has embarked upon an anti-corruption campaign that includes a drama, performed by the Young Members Panel, as well as a training programme that focuses on ethics and anti-corruption. The drama, adapted from the American Society of Civil Engineers' *Ethicana*, depicts facets of corruption in the civil engineering industry and provides solutions for its eradication. This drama was performed so successfully that the group was invited to perform in Tanzania in November 2010. Subsequently the team has been invited to Ghana and Zimbabwe, and has also received an invitation from our own National Science and Technology Forum.

While corruption and unethical behaviour in the public service is highlighted because it is in the "public eye", the private sector is by no means immune to dishonest practices. In fact, often the private sector and individuals conducting business for the public sector are the initiators of corrupt practices, offering bribes to public officials, as well as acceding to officials' requests for unscrupulous benefits.

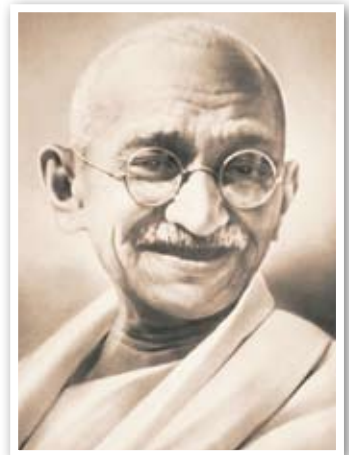
It was a well-known and documented practice for European companies working in Africa to "budget" for bribes in project costs. The exemplary stance of the Lesotho Government in the corruption cases of Acres International and Lahmeyer International GmbH in 2003 has to be lauded as one of Africa's greatest victories over corporate corruption. This led, in addition to heavy fines, to debarment of these companies by the World Bank from participating in any World Bank funded projects. The then CEO of the Lesotho Highlands Development Authority was given an 18-year jail sentence for accepting bribes. A similar attitude to corruption cases in South Africa would go a long way towards eradicating the problem.

The Credo of the African Engineer

It was Mahatma Gandhi who said: "The things that will destroy us are: politics without principle, pleasure without conscience, wealth without work, knowledge without character, business without morality, science without inventing and worship without sacrifice."

This is apt for South Africa and the world right now.

So with these words ringing in our ears, I present you with the proposed "Credo of the African Engineer", based on the shared values of the "Order of the Engineer", first recited at Fenn College of Engineering at Cleveland State University, in 1970.



SAICE has had a long journey in reaching this point and we do not claim to have arrived yet, as the input of our fellow engineers in other disciplines still needs to be sought before we finalise the Credo. We also strive towards the adoption of the Credo by engineers in other African countries.

Vote of Thanks

I thank my predecessors for their guidance, wisdom and selflessness. I wish to convey special gratitude to past President Allyson Lawless, who in 2000 first expressed confidence in me as future president of SAICE and made me promise to take up the presidency. She reminded me of my promise consistently every year for ten years. I also thank the SAICE Council for the support and confidence they have shown in me to lead the institution, as well as the staff and the new CEO for their magnificent effort to make this inauguration a splendid occasion.

I am grateful to the shareholders of Makhetha Development Consultants, who have graciously agreed to release and support me during this year.

On a very personal note, and most importantly, I would not be standing before you were it not for the love, support and sacrifice of my precious family. I am deeply indebted to Martha, my wife, who has generously agreed that I accept this mantle – she has supported me throughout my various roles in SAICE. My gratitude also goes out to my daughters, who have understood my “addiction” to SAICE and have supported me. Finally, I honour my mother for her sacrifice for my development – my mother who “went to church in her twisted pair of shoes” to ensure that her children got the best education they could. To my entire family, I thank you for your support.

I thank you all.







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