Building Engineering Capacity for the Rural Transport Sector in Africa

Workshop 4 - 5 December

Kampala - Uganda

A presentation by

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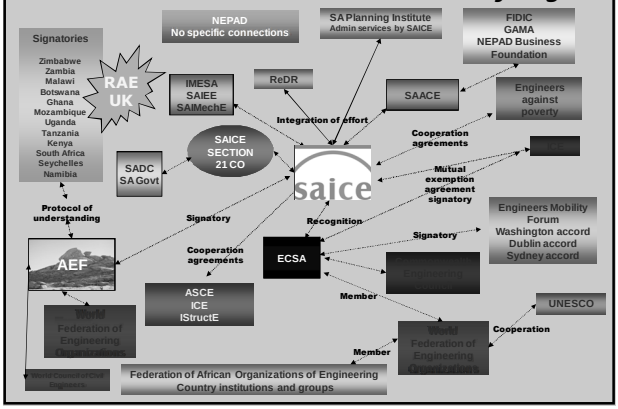
SAICE IN 2009

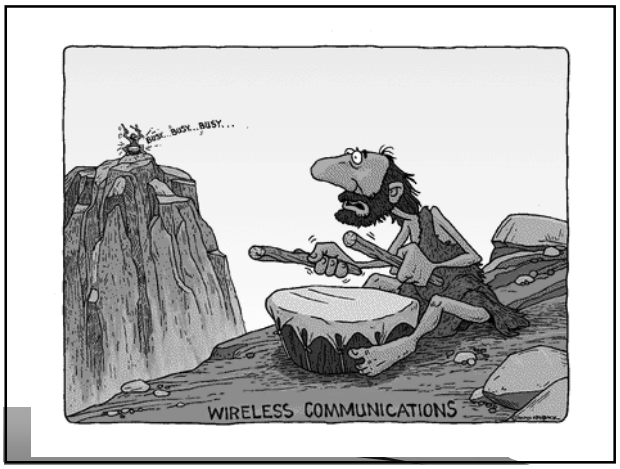
National & International network and activity diagram



Sustainable engineering infrastructure and services are the basic cornerstones of life, civilization and economic wellbeing of communities.

Across the world, there is a huge deficiency in capacity to understand the need for, how to develop, deliver, maintain and care for infrastructure and services.

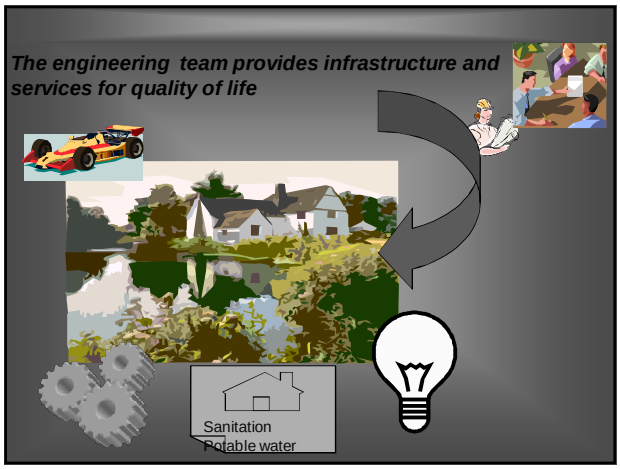
Imagine a world without Engineers…..



Sustainable Engineering

is a prerequisite for

sustainable development



There can be no sustainable development, poverty alleviation and eradication and the eventual creation of wealth without appropriate, viable and well-maintained engineering infrastructure

There can be no viable and sustainable engineering infrastructure without

appropriate standards, codes, specifications, supporting documents

There can be no viable and sustainable engineering infrastructure without a knowledge-based network which has traditionally been provided by voluntary professional organizations like SAICE as well as Statutory Quality Assurance organizations like ECSA

In 1995 SAICE initiated the Africa Engineers Forum which was modelled on the ASCE International Round Table

A comprehensive protocol of understanding was developed in 2002 and eventually expanded at Kariba in 2004

Our AEF Vision is

To have an appropriate level of efficient human & technical capacity to enable Africa to develop and sustain prosperity for all in Africa

With reference to skills development our mission is to

Contribute our resources and expertise in partnership with key stakeholders

Accomplish the transfer and assimilation of the value of best practice principles of sustainable development to decision makers and communities at all levels

This Protocol clearly sets out the framework for achieving sustainable engineering in a practical and achievable format

Protocol items include practical and achievable items such as

Communication at a technical level amongst engineers, both resident within and outside Africa

Internationally accepted norms in terms of conduct, integrity, ethics, engineering standards and care for our people and our environment

An African electronic web database for technical information linked the worldwide community of Engineers

Exchange of information and sharing of experiences regarding engineering practice

Dissemination of relevant published technical papers, articles and editorials

Exchange of and access to technical journals and magazines for reference purposes

Professional and technical networking opportunities and events

An events database concerning annual programmes of events, including those relating to

continuous professional development

Best and good practices in terms of affordable and appropriate engineering standards,
processes, procedures, methods or systems in relation to procurement & delivery processes and the life cycle of products and assets

Harmonization of standards, documentation, methods and procedures as appropriate

The use of procurement as an instrument for development and capacity building

Gender participation and equality in engineering practice

Networking amongst African tertiary educational institutions involved in engineering-related education

Appropriate education and training for engineers dealing with the challenges of rural development

Public awareness programmes in order to enhance the visibility and recognition of the role of the engineering profession in African civil society

Pertinent science and technology policies including research and development initiatives by Governments in Africa

Capacity building in order to develop knowledgeable decision-makers, clients and users of engineering infrastructure and services

Government participation in engineering practice and related matters

AND VERY IMPORTANT

Best practice relating to foreign investment and donor involvement and influence in Africa

Outreach and career guidance programmes

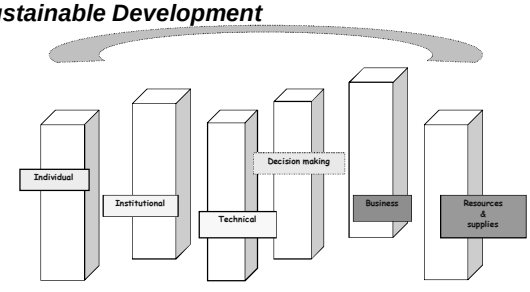
Liaison with decision-makers, industry stakeholders, clients and other built environment professionals

What is NOT generally understood is the need for skills in ALL sectors including

Professionals
Decision-makers
Employers
Construction Industry
Suppliers
Commerce
Service providers
Institutions

From Protocol to a more understandable illustration

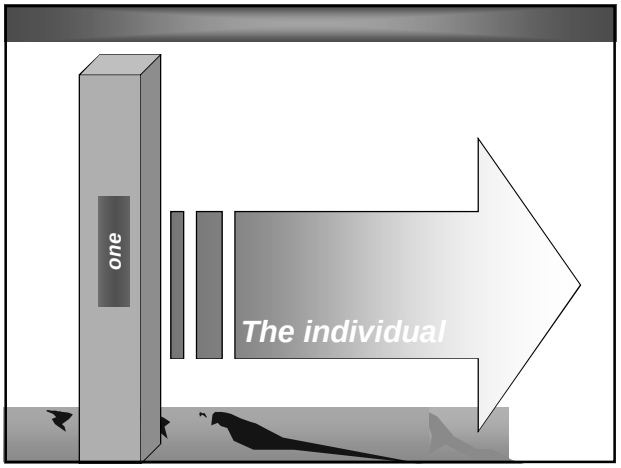
Understanding
Sustainable Engineering as a prerequisite for Sustainable Development



The six pillars of CAPACITY and SUSTAINABLE ENGINEERING

The six pillars supporting engineering capacity

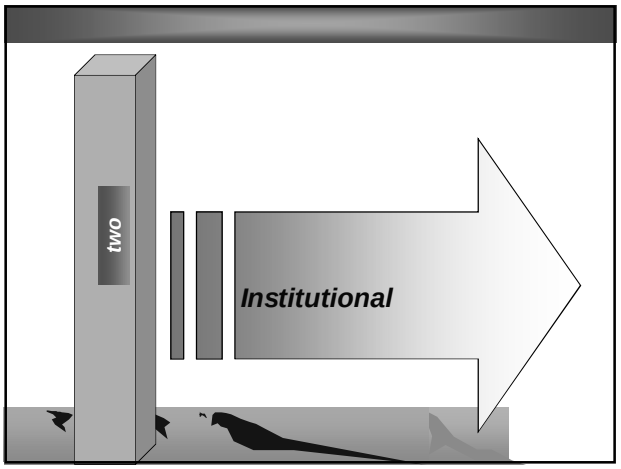
1.Individual
2.Institutional
3.Technical
4.Decision-making & community
5.Business
6.Resources and supplies



Pillar one

Each individual who participates in the engineering profession or industry as well as associated areas of activity should be:

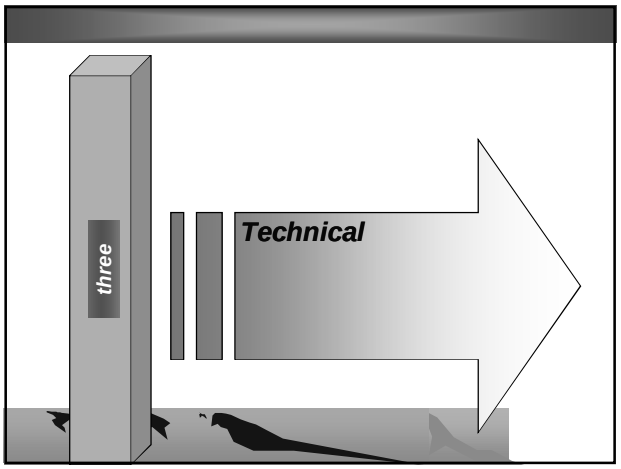
Informed
Educated
Trained
Equipped
Networked



Pillar two

Professional organisations and societies

Statutory boards, councils, foundations and other structures



Pillar three

"Tools of the trade"

or

the instruments that the individual as well as the organized professions, industry, clients and employers need,

to attend to or to procure and to maintain infrastructure.

three

Key components in this section would for example be

sustainability
appropriateness
affordability
awareness
safety and health
fair labour practices

three

Specifications

Standards

Procurement documents, including General Conditions of Contract

Codes of Practice

Guidelines

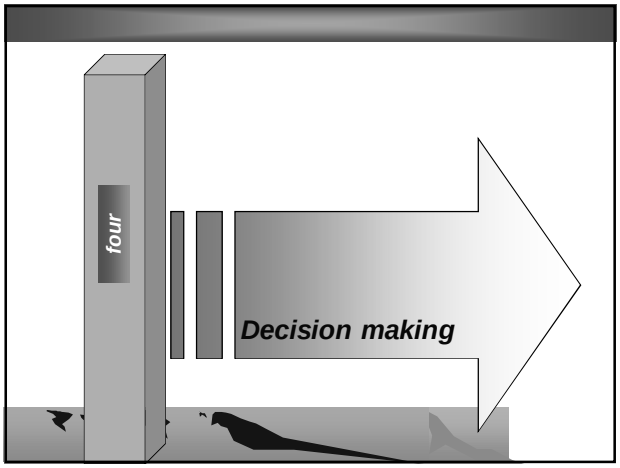
three

Codes of ethics and codes of practice

Technical handbooks

Software and hardware

Technical information from research papers



Pillar four

Communities and the formal decision-makers play a huge role in the development and maintenance of engineering infrastructure

In many places across the world even developed countries suffer heavily due to a lack of understanding the role and the importance of infrastructure and how it should be approached and managed

four

The Built Environment Professions are not well understood and remain somewhat elitist in the eyes of many people – we need to dispel thet notion wi

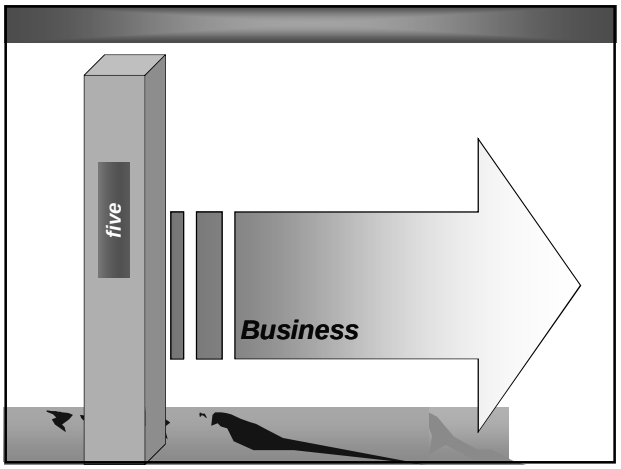
four

Empowerment of for example teachers and parents to advise learners and children and to make the vital connection between what is taught at schools and the reality of applying this knowledge in a career in professions and industry

four

KEY aspects are the need to

create
Awareness
provide
Orientation



Pillar five

The availability of a commercial infrastructure to support any engineering infrastructure development and the maintenance thereof is an obvious pre-requisite for a viable environment.

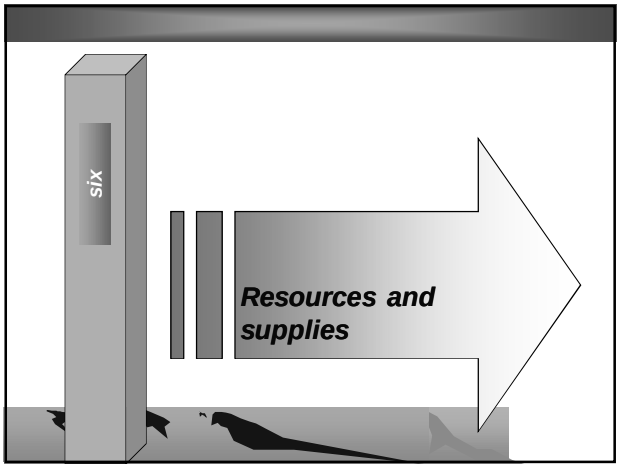
There are numerous examples of how a lack of this type of capacity influences successful development

five

The main components could include:

Factories, quarries, timber mills

Distribution networks, including wholesale and retail



Pillar six

Resources to underpin built environment activities in a sustainable manner include:

raw materials for construction

manufactured and finished products used in construction

funding and financial frameworks and sources of income

six

Components could possibly include

Banking networks
Funding and investment facilities

Resources of sand, stone, timber

These six pillars
individually
and
collectively
underpin sustainability as demonstrated in the AEF Protocol of understanding

one *two* *three* *four* *five* *six*

What is capacity building?

It is the building of
human,
institutional,
infrastructural capacity
to help societies develop
safe, secure, stable
and sustainable economies, governments and other institutions

What is capacity building?

Capacity building is

assisting people to develop the technical skills to address their own needs for improving the living standards and prosperity of their own people and building an environmentally sustainable society

Development and Renewal

*Capacity building is relevant and important for **all nations***

- *Capacity building in developing nations – establishment phase*
- *Capacity building in developed nations – renewal stage*

HOW can capacity be developed and maintained?

Through mentoring , training, education, physical projects, the infusion of financial and other resources and more importantly

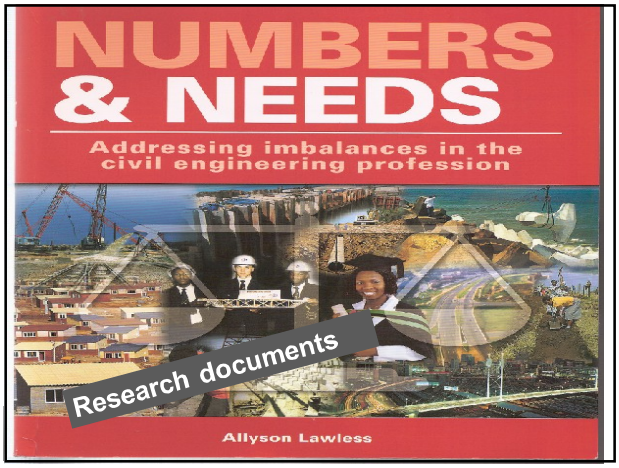
- ***the motivation and inspiration of people***
- ***developing a culture of learning***

The time has come to develop

an integrated,
generic,
appropriate,
effective
&
comprehensive

set of engineering related guidelines related to Capacity Building Programmes that can be promoted and implemented

without delay



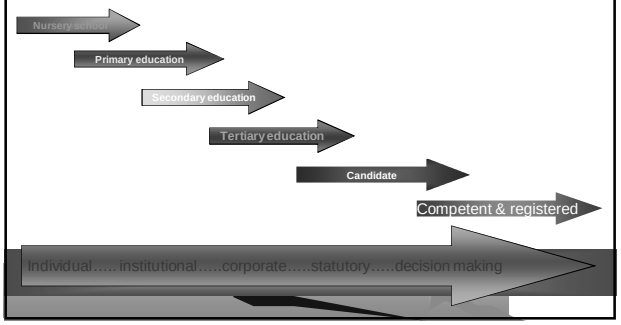
country	number of people per registered engineer	number of people per registered Medical doctor
Swaziland	12 300	9 100
South Africa	3 166	1 493
Ghana	12 800	2 500

Brazil	227	379
South Africa	3 166	1 493
???	???	?

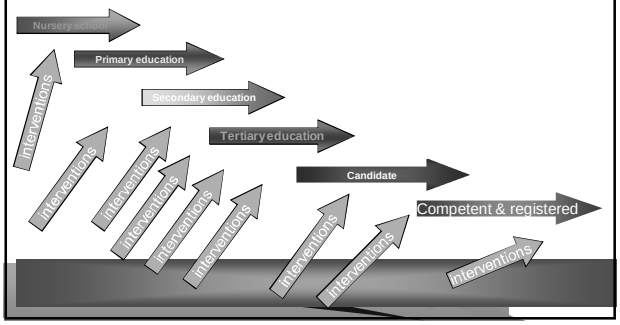
The HEALTH connection

A very well known Prof of Medicine Harry SEFTEL said that the increase in the life expectancy in the world cannot be attributed to his profession but to the efforts of the ENGINEER and specifically to the provision of SAFE water and sanitation services

We need to align and integrate our efforts



Aligning our efforts



Tools to facilitate and assist

WFEO Capacity Building Guideline book

To be launched in October 2010 in Argentina

Primary and secondary school

Brochures
Science centres
Science expo
Maths and science programmes
Youth in construction
Structural Pin game
TRAC RSA and USA
Engenius
Laduma numeracy
Youth service
World without engineers cartoons
Training handbooks for learners and teachers
Technical Handbook – Civil Engineering education

Tertiary level

University curricula
Coaches and mentors
Facilities
EXCeeD
Remuneration of Academics
Experiential training
Outreach to Students
Students chapters
Young members forum

Post graduate before registration as professional

Training programmes
Mentors
Mentor guidelines
Experiential training
Energys
CPD

Institutional

Congresses and conventions
Code of ethics
Code of conduct
Promotional items
Magazine
Technical Journal of refereed papers
News letters
email alert and news systems
Strategic Planning – ASCE Vision 2025
Body of Knowledge
Agreements of cooperation
International Round Table
Africa Engineers Forum
The World according to SAICE

Decision making and outreach

Public awareness and community interaction
Media awareness
Talking engagements, TV appearances
Public advice service
Local Authority orientation
Engaging government – Parliament
Anti corruption
Leadership programmes
History and heritage
Key contact programme
Senior lobbyists
Disaster resilience guidelines
Statutory regulation
International reciprocity
Report cards

Technical

Contract documents
Mediators, arbitrators and adjudicators
Specifications
Best practice guidelines
Codes of practice
Bookshops
Practice Manuals
CIDB Brochure construction
Procurement
CPD
Congresses
Statutory structures like councils for research, construction industry developments boards, standards organizations

Engineering professionals are not only the custodians of infrastructure but has in many instances taken on board:

to facilitate and enhance the knowledge of not only themselves to deal with the challenges of our times,

but also to assist decision makers from all levels of society, from the small children to the leaders of countries to ensure a sustainable world for all.

For the sake of the communities we serve and for the sake of our world in crisis

Engineering professions will have to go beyond the call of duty for the benefit of citizens and communities around the world

WE HAVE TO SHOW THE WAY

My personal thanks
on behalf of
the

South African Institution of Civil Engineering

saice

AFRICA ENGINEERS FORUM

to the organizers
for taking the initiative to facilitate the debate
& for the privilege to participate and contribute

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