# ISSMGE AFRICA REGION "THE PAST" (Continued)

It is understood that Egypt was the first African member to join the International Society of Soil Mechanics and Foundation Engineering, as it was then known. South Africa followed in 1948 when the Division of Soil Mechanics and Foundation Engineering of the South African Institution of Civil Engineers was formed at the 2nd International Conference in Rotterdam.

In the years that followed, a further nine African Member Societies were added including Ghana, Kenya, Nigeria, Sudan, Tunisia and Zimbabwe (then Rhodesia), Morocco and Mozambique. Sadly the membership of two of these members has since lapsed and only nine societies remain in the African region.

The membership of the International Society comprises member societies from various countries around the world which are grouped into six regions. The various member societies declare their individual membership numbers to the International Society on an annual basis and these numbers are used in the determination of the fees payable to the ISSMGE by the member society. In terms of the number of individual members, the South African member society has always been the largest society in the Africa region, having more individual members than the rest of Africa combined. However, these figures have been distorted by the approaches adopted by the various member societies in registering their individual membership with the ISSMGE. In South Africa, the practice has always been to enrol all individual members of the Geotechnical Division as individual members of the ISSMGE. On the other hand, some member societies elected only to register their senior members, probably in an attempt to reduce the fees payable to the International Society.

In order to encourage member societies to register their full individual membership with the International Society, the ISSMGE scale of fees was revised by resolution of Council in 2005. The new fee scale, although based entirely on a per capita fee, depends on the purchasing power parity of the member country. This was coupled with an obligation to pay for a minimum of thirty individual members per society and rewards for societies with more than 250 individual members. As a result, the individual membership of certain African societies has increased dramatically with Egypt now being the second biggest member society in the region.

## COLONIAL INFLUENCES

The majority of the countries in the Africa region started off as colonies of European powers including the United Kingdom, France, Portugal, Belgium and The Netherlands. Inevitably, this has had an effect on the way in which soil mechanics is practiced within the various countries. Even in countries such as Egypt where there was no such colonial power, the practice of soil mechanics has been influenced by the universities attended by senior academics and practitioners, many of these situated abroad.

One of the most immediate influences is the effect of language. It is perfectly natural for the French-speaking countries of northern and western Africa to adopt methods of investigation and design originating from France, for the Portuguese-speaking countries of southern Africa to look to Portugal and Brazil for technical input and for English-speaking countries to be influenced by British practice and standards. Perhaps the most striking example of this colonial influence is the formation, under French patronage, of the Trans-National Committee of African Geotechnical Engineers in 1996.

Le Comité Transnational des Géotechniciens d'Afrique, or CTGA consists of geotechnical engineers from French-speaking African countries where there is no national representation on the International Society. In many of these countries, technical co-operation with France is further strengthened by collaboration at many levels including universities, testing laboratories, government departments and consulting organisations. A brief contribution on the history of the CTGA is appended to this report.

# ISSMGE AFRICA REGION "THE PAST" (Continued)

Even in countries such as South Africa, where most engineering organisations are independent of government and many colonial links have been shaken off, there is still a vestige of colonial influence in the design standards that are used, the methods of testing employed and the overseas universities attended by post graduate students fortunate to study abroad.

## REGIONAL ACTIVITIES

### 1.1 African Regional Conferences

The African region has held fifteen regional conferences as listed below. Nine of these conferences were held in southern Africa, four of them in South Africa.

| No. | Year | Venue |
|---|---|---|
| 1st | 1955 | Pretoria, South Africa |
| 2nd | 1959 | Lourenço Marques, Mozambique |
| 3rd | 1963 | Salisbury, Rhodesia |
| 4th | 1967 | Cape Town, South Africa |
| 5th | 1971 | Luanda, Angola |
| 6th | 1975 | Durban, South Africa |
| 7th | 1980 | Accra, Ghana |
| 8th | 1984 | Harare, Zimbabwe |
| 9th | 1987 | Lagos, Nigeria |
| 10th | 1991 | Maseru, Lesotho |
| 11th | 1995 | Cairo, Egypt |
| 12th | 1999 | Durban, South Africa |
| 13th | 2003 | Marrakesh, Morocco |
| 14th | 2007 | Yaoundé, Cameroon |
| 15th | 2011 | Maputo, Mozambique |

In recent years, a concerted effort has been made to ensure a more equitable distribution of conference venues, both in terms of geographical distribution and language. A reasonable alternation of the conferences between countries north and south of the Equator has been achieved since 1975. Since 1999, two of the regional conferences have been held in French-speaking countries and one each predominantly Portuguese and English speaking countries. It is hoped that this process will continue into the future. A similar effort towards achieving equitable distribution is also in place for the selection of Regional Vice-Presidents.

### 1.2 International Events

Like Australasia, Africa has not hosted many events of the International Society. Resolutions passed by the ISSMGE Council in 2005 sought to address this imbalance.

Prior to this, the only Society-wide event held in Africa was a meeting of the ISSMGE Board in South Africa's Kruger Park in November 2002.

The resolutions passed by Council in 2005 seem to have had the desired effect as a meeting of the ISSMGE Board was held in Tunis in 2007 and the 17th International Conference of the Society was held in Alexandria, Egypt in 2009.

# ISSMGE AFRICA REGION "THE PAST" (Continued)

ISSMGE Board and family members in the Kruger Park, 2002 (Photo courtesy of Luiz DeMello)

### 1.3 Areas of Research

If one goes back into the proceedings of the various African Regional Conferences, there are certain topics that emerge time and time again. These are: tropical and residual soils, laterites, pedocretes and unsaturated soils. Problem soils are widespread throughout the region and include heaving clays, collapsible sands, dispersive soils, soft clays (mainly in the coastal regions) and dolomites (mainly in South Africa). The interest in pedocretes and laterites is often connected with their use as construction materials, mainly for roads, earthworks and railway lines.

One of the joys of the African Regional Conferences is that they tend to be heavily focused on practical issues and directly relevant to the developmental challenges faced in the area. Although there are areas where "fundamental" research is being undertaken, much of the research effort reflected in the proceedings of the Regional Conferences is applied research relative to the region.

**WHAT MAKES US AFRICAN?**

When one travels around the Region, one becomes acutely aware of how different we Africans are; language, culture, religion, skin colour, dress, modes of transport, standard of living, population density, housing, food and drink preferences, and so on. So what is it that unites as Africans?
In one word - "challenge".

Africa is a vast continent. Apart from Asia, it is geographically the largest of the ISSMGE regions. It is one of the more sparsely populated regions but has the highest population growth rate. It includes extremes of climate and vegetation from desert to equatorial rain forests. It has a mighty rift valley, folded mountain ranges, large kratons of igneous rock, "seas" of quaternary sands and vast sedimentary basins. It is a region rich in both natural and human resources.

The challenge referred to above stems from the necessity for balancing the development requirements of the region with the limitations on available capital. This, coupled with the relative absence of restrictive regulations makes being a geotechnical engineer in Africa a very exciting prospect. This is why our

# ISSMGE AFRICA REGION "THE PAST" (Continued)

approach to geotechnical engineering since the early days has always been innovative and intensely practical.

As we look back on our past, we can be proud of what we have achieved. It is hoped that this pioneering spirit will prevail as a hallmark of the Africa Region in the future.

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APPENDIX

Le Comité Transnational des Géotechniciens d'Afrique
by Michel Gambin (France)

In France, after WW II, the Public Work Contractors and the leaders in the Building Industry created two Unions, respectively the FNTP and the FNB. These two Unions joined their efforts to set up a Research Center, the CEBTP, somewhat similar to the BRE in the UK. Rapidly, this CEBTP was the leader for geotechnical site investigations in France and in those French colonies still in existence. When freedom was given back to these colonies, the CEBTP set up Laboratories for both the Building Industry and the Public Works: *i.e.* an LBTP, in each new independent State.

With the aim of a better efficiency, an Association was created between all these National LBTPs, under the logo ALBTP for African Association of the Public Works and the Building Industry. The seat of this ALBTP was at Casablanca, Morocco. Every year an AGM was held in turn in the Capital City of each African Country together with that of the Heads of the Road Departments of the government of these countries (ADAR).

But the CEBTP had to face the expansion of various types of small firms, most of them using Pressuremeter tests for their site investigations and this became a heavy financial burden for the two Unions. The CEBTP was finally sold to some investors. The ALBTP started to decline, since it no longer received any incentive from the CEBTP, now a private company.

Being freshly retired from his main employment in 1992, Michel Gambin started to develop a Francophone lobby within the geotechnical world. He met with some previous employees at the Head Office of CEBTP and collected a list of the last heads of each African LBTP. Within the French Member Society of the ISSMFE, the CFMS, it was decided to support the formation of a CTGA.

A first meeting was held during the Cairo Regional Conference of the ISSMGE in 1995 where the participation of members of the CFMS was especially higher than usual. During this meeting, on the 14th of December 1995, under the Chairmanship of Prof. El Ghamrawy, then Vice President of the ISSMGE for Africa, it was decided to organize an African Francophone Geotechnical Conference in Morocco, more exactly in Marrakech, in September 1996.

This Conference was held on September 17-18, 1996. A Constitutive Meeting of the CTGA was held and the new CTGA was created to gather all the geotechnical Engineers of the 22 or so Francophone African

# ISSMGE AFRICA REGION "THE PAST" (Continued)

Countries. Since then, not only professionals of the BTP, but also professors from various Universities joined the CTGA. The ALBTP naturally kept its autonomy.

Among the few activities, AGMs are held each year in one of these countries during the same week as the meeting of members of ALBTP and of AGEPAR (the Road Network Managers Union created by the IMF). Some French Geotechnical Engineers are invited to deliver lectures on specific topics. The CTGA also organized the ISSMGE African Regional Conferences at Marrakech (2003) with the Moroccan Society and at Yaoundé in Cameroon (2007).

Another Institution that has more recently come into the picture is the UISF "Union Internationale des Ingénieurs et Scientifiques utilisant la langue Française" www.uisf.fr. The UISF proposes Seminars and Symposia on various topics adapted to African problems. Surprisingly, the originator of the UISF is the former Scientific Manager of the original CEBTP! This Engineer, now 86, is still very active.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT

Professor Samuel U. Ejezie
Vice President for Africa

**Introduction**

Africa is a Region where Geotechnical Engineering problems abound, yet the general world-wide perception remains that the profession is relatively not well-developed here. As we celebrate 75 years of existence of ISSMGE, it is therefore necessary that we should take stock and ascertain where exactly we are in this developmental march. I have programmed this presentation to essentially cover the present state of the activities of this International professional body within the region together with special highlights of our key thrusts for the future. My predecessor in office is billed to take us down memory lane by speaking about the past, while a young member will thrill us with future expectations of the Society in the Region.

On my assumption of office in Alexandria last year I did pledge to work towards closer cooperation among African Member societies of ISSMGE from North to South and from East to West. This is with a view to integrating Geotechnical Engineering activities around the continent so that solutions to geotechnical engineering problems experienced in many parts of the Region may be found within Africa itself. To demonstrate our continued commitment to this crusade, African members of ISSMGE were especially motivated and strongly encouraged to participate in activities being organised by sister African member societies. In fact, the present slogan or advocacy is that Geotechnical Engineering should be practised in Africa without boarders so that we can together find local solutions to our ground engineering problems. Isolated cases of border and visa restrictions typical of developing economies did however rear up their ugly heads now and then tending to dampen our enthusiasm. This notwithstanding, the benefits of our cooperation have started manifesting, judging from the wide geographical spread of participants recorded in events organised by member societies in the Region in recent times. Based on this, one can confidently predict that the era of using models developed for soils of other climatic zones to solve problems related to the engineering behaviour of African soils will soon be over. We have to work together to develop appropriate models for soils of Africa.


ISSMGE IN AFRICA REGION TODAY

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

***Present Platforms for Working Together***

ISSMGE members in other Regions frequently collaborate and work closely together under the umbrella of different Technical Committees – some Regional, some International. Until very recently, this opportunity never existed in Africa and members could hardly relate one-on-one or interact to discuss the geotechnical engineering problems in the Region.

At present however, we are happy to report that we now have an International Technical Committee domiciled in Africa. This is the very first time such an opportunity is being placed within the reach of members in Africa Region. The Committee is named "Technical Committee on Laterites and Lateritic Soils". As is evident from the name, this Committee will serve as an ideal platform for studying and proffering solutions for engineering challenges related to problem soils of Africa. The host country is Ghana, while the Chairman is Professor S. K. Ampadu of Kwame Nkruma University of Science and Technology, Kumasi, Ghana.
The idea for the formation of this Committee was initiated a long time ago during the tenure of Prof. P. S. Pinto as ISSMGE President. We are happy that the current indefatigable President, Prof. Jean-Louis Briaud, drove the process to a logical conclusion and helped us realise the dream. It is now left to ISSMGE members in Africa Region to embrace the opportunity created by this Committee. Within it we would be able to work together on common geotechnical engineering problems in the Region by integrating our intellectual resources and professional expertise.

***ISSMGE Activities within the Region***

At present a relatively high level of activity is witnessed in some ISSMGE member societies in Africa Region. This is a drastic departure from the relatively low levels (of activity) generally observed in the past. The last international quadrennial conference of ISSMGE in Alexandria, Egypt, apparently re-awakened some of the hitherto dormant national member societies. As a result, eleven member societies exist in the Region today though at different levels of activity. They include South Africa, Tunisia, Egypt, Nigeria, Ghana, Mozambique, CTGA (Comité Transnational des Géotechniciens d'Afrique), Sudan, Morocco, Algeria, and Kenya. We are currently making serious efforts to re-energise those of them that are considered to be less active (or inactive). It is also our hope that CTGA would soon give birth to off-springs. By so doing, more independent (or autonomous) national member societies, particularly of francophone extraction, will be formed and admitted into ISSMGE, thus increasing Africa's impact and representation in the International Society.

Since my assumption of office as Vice-President for Africa in October 2009, some of the member societies have carried out various activities which in some cases were international in scope. In fact, landmark Geotechnical Engineering events by member societies have been very noticeable and this has been particularly more pronounced in the two longitudinal extreme zones of the continent, namely North and South. The mid zone (sub-Sahara) is expected to catch up soon though it has peculiar challenges occasioned by unique socio-economic realities.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

***Overview of the Present State of Member Societies***

The major events and activities in the various member societies since this period are summarised subsequently.

**a) SOUTH AFRICA**

The South African member Society is very active and helps to keep the fire of geotechnical engineering burning with high intensity in the southern zone of Africa. Under the able leadership of its current President, Dr Eduard Vorster, and his Executive Committee the Society recently organised a well-attended

International Seminar in Pretoria on 30 July 2010. The President of ISSMGE, the Secretary General, the Immediate Past President of ISSMGE, the Vice-President for Africa, the Immediate Past Vice-President for Africa and the one before him were all there to grace the occasion and actively participate. This was preceded on 29 July by hosting of two meetings. The first one was a meeting of the Scientific Advisory Committee (CAC) that nurtured this 15$^{th}$ African Regional Conference, while the second was a meeting of the African Regional Council (comprising representatives of member societies in the Region). Worthy of special mention here is the fact that the South African member society played an outstanding leadership role in the Scientific Committee and this led to the timely adjudication of papers and publication of the Conference Proceedings.

Another attribute of this vibrant member society is that it has in place a regular programme of geotechnical engineering activities which include the Rankine and Jennings lecture series, and Annual Awards scheme for recognising excellence and outstanding contribution to geotechnical engineering in South Africa.

**b) TUNISIA**

The Tunisian National Member Society is presently very active. Since the last ISSMGE quadrennial Conference in Alexandria, the ATMS has been playing a major role in keeping the geotechnical fire aglow in the northern zone. The present Executive Committee is constituted as follows:

i. Mr. Slaheddine HAFFOUDHI (Hydrosi Foundations) – President
ii. Mounir Bouassida (ENIT & Simpro) – 1st Vice President
iii. Mehrez Khemakhem (ISET Sfax) – 2nd Vice President
iv. Mrs Faten SAIHI (ISTEUB) – Secretary General
v. Mrs Imen SAID (ENIT) – Vice Secretary General
vi. Mrs Samis BOUSSETTA (ENIT) – Treasurer
vii. Mr Wissem FRIKHA (ISSHT) – Vice Treasurer
viii. Mr Kamel ZAGHOUANI (Terrasol Tunisie) – Member

The climax of their activities was the successful organisation of their 2nd International Geotechnical Engineering Conference which took place 25-27 October 2010 in Hammermet, Tunisia. It was the only major international Geotechnical Engineering conference in the whole of Africa throughout the year, 2010. Papers were contributed by about 100 participants from 25 different countries. The ISSMGE President and the Vice-President for Africa were there live. Appointed Board member, Prof. Roger Frank was also there; and so were other keynote speakers. The occasion afforded the Vice-President and the President the opportunity to hold a sensitisation meeting with interested participants on the new TC 107 - ”Laterites and Lateritic Soils”.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

Not long after this conference, the Tunisian member society, along with other French-speaking North African countries, also organised the Mergrebian Conference which took place mid-December 2010.

**c) MOZAMBIQUE**

The Mozambique national member society is undeniably very active. Its recent activities focused primarily on preparations for this 15th African Regional Conference. The President, Carlos Quadros, Secretary, Saturnino Chembeze, and all members of both the Executive Committee and Local Organising Committee demonstrated outstanding leadership and commitment which contributed immensely to the success story we are witnessing here today.

In addition to the 15ARC related activities the society also engaged in other activities, mainly seminars and workshops, aimed at professional development of the members.

**d) NIGERIA**

The Nigeria member society (Nigerian Geotechnical Association) is relatively active. It has a new Executive Committee constituted as follows:

Prof Samuel U. Ejezie – Chairman
Engr Fidelis Ejikeme – Vice Chairman
Engr. Scott B. Akpila – Secretary/Programme Coordinator
Engr. Sebastine Ozoamalu – treasurer
Engr. Olaposi Fatukun – Financial Secretary
Engr. Dr. Joseph I. Folayan – Immediate Past Chairman/Ex-Officio
Engr. Enoch George – Ex-Officio

The new leadership has aggressively embarked on revival of professional development activities for members and employees of corporate bodies.

In pursuance of this, an intensive skill-level learning event, in the form of "Geotechnical Engineering training course" was organised for a batch of Civil Engineers in the employment of Shell Petroleum Development Company Ltd. This took place from 22 November to 04 December 2010, with participants drawn from Nigeria and Gabon. The Society has also standardised this programme to run regularly as an annual event.

Presently, the Association is collaborating with the Nigerian Society of Engineers in the preparation of Codes of Practice of Geotechnical Engineering for the country.

**e) GHANA**

Ghana Geotechnical Society has been very active of recent. The present executive committee is made up of:

| | | |
|---|---|---|
| President | - | Prof. S. I. K. Ampadu |
| Secretary | - | Mr Joseph K. Oddei |
| Treasurer | - | Mr Kweku Mensah Solomon |
| Member | - | Mr Gordon Van-Tay |
| Member | - | Mr J. F. Pinkra |
| Southern Rep | - | Mr Emmanuel Odai |
| Northern Rep | - | Mr Mike Konadu |

The President of Ghana Geotechnical Society, Prof S. K. Ampadu, was recently appointed Chairman of TC 107 "Laterites and Lateritic Soils". The society has pledged full support for this and to cooperate with Prof Ampadu to ensure the success of the New TC.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

Furthermore, Dr Gidigasu of Ghana, a renowned authority on Laterites, delivered a keynote lecture on lateritic soils in this Conference, and we are all witnesses!

Earlier in 2009, the Ghana Geotechnical Society (GGS) in collaboration with ISSMGE organized a well-attended international seminar from 2nd-4th February 2009 at the Engineers Centre in Accra. The seminar was attended by 66 participants including three participants from Nigeria. The participants were drawn from private consulting firms, public infrastructure companies, academia, and construction firms. Locally, the seminar was under the patronage of the Kwame Nkrumah University of Science and Technology, the Ghana Institution of Engineers and the Ministry of Transportation of Ghana. The theme was "Ground Improvement for Accelerated Development" reflecting Ghana's recent move towards rapid infrastructure development as a strategy for poverty reduction and economic development.

The seminar sought to expose Ghanaian engineers to new trends in ground improvement technologies, to provide opportunity for Consultants, Contractors and developers who have applied new technologies in ground improvement to share their experience and finally to help promote professional geotechnical engineering practice in Ghana.

**f) CTGA**

The Society is relatively active. It recently held a colloquium from 17th to 18th February 2010 in Yamoussoukro, (Ivory Coast) which was well-attended by participants from Franco-phone countries in Sub-Saharan Africa. On the whole, more than 50 members were in attendance. The theme of the colloquium was "Foundations of infrastructures in Sub-Saharan Africa – Design and Case Histories".

It was sponsored by the CTGA and the Association of African laboratories for Buildings and public works (ALBTP). 9 (nine) communications were presented by CTGA experts followed by suitable and fruitful discussions. Almost 70 delegates from 9 countries attended this colloquium.

A general Assembly of CTGA took place on the 19th February 2010 and the following members were elected to implement geotechnical training programme for the entire CTGA geographical region.

- Dr Papa Goumbo lo, Pr Ibrahim Khalil Cissé ;
- Dr Mamba Mpele, Dr Marcelin Etienne Kana ;

Other recent activities of CTGA include:

i) A series of training courses in geotechnical engineering, and laboratory and in situ testing launched by the Cameroonian CTGA national group (CNGC) in April 2010.
ii) A technical colloquium/seminar on the main theme "Soil stability and its impact on constructions in Sub-Saharan Africa", sponsored by the CTGA and the Association of African laboratories for Buildings and public works (ALBTP) from 16th to 17th March 2011 at the conference hall of BUJUMBURA (Burundi). 14 (fourteen) communications were presented by various experts from Cameroon, France, Congo, Burundi, Morocco, followed by fruitful discussions. Almost 70 experts from 9 countries attended this colloquium.

At present, plans are on-going to encourage countries capable of standing alone to form their own national member societies.

**g) EGYPT**

The Egyptian national member society is relatively active. Since the end of the 17$^{th}$ International Conference of ISSMGE in Alexandria, the Society has been involved in different activities most of which promote the positive impact of geotechnical engineering in the society. The most significant of these activities include:

1. Collaboration with the Governorates of Matrouh and Aswan on mitigation methods of flash floods.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

2. Cooperation with the "Military Technical Academy" on the "Fifth Engineering Conference of the Military Technical Academy, which held from 25th to 27th May 2010.
3. Establishment of the organizational structure for a National Geotechnical Conference that is to take place late 2011 at Tanta University.
4. Co-operation with the "Supreme Council of Antiquities" in projects of restoration of monuments and stability of several archaeological sites all over Egypt.
5. Establishment of a Geotechnical and Geo-environmental Research Centre at the University of Tanta, Egypt.

***Present Key Thrusts***

With the reorganisation of ISSMGE embarked upon by the present Board led by Professor Jean-Louis Briaud largely completed, the time has come for Africa Region to properly key-in to this progressive framework. Doing so will enable us catch up with the rest of the continents of the world in Geotechnical Engineering practice.

Key thrusts of our present regional agenda have been mapped out, circulated among member societies, freely discussed among members across the Region and adopted in principle. Highlights are summarised as follows:

1. **Promotion of Increased Collaboration among Member Societies as well as their Leaders.**
   The collaboration will usher in an era of increased cross-boarder geotechnical engineering activities. The idea is to promote an atmosphere of good neighbourliness and mutually beneficial professional relationships so that geotechnical engineering events organised by member societies will attract participation from sister societies from all over Africa Region. This collaboration model is operational in other regions.
2. **Formation of Technical Committees Domiciled in Africa Region.**
   Discussions have been on-going for sometime now regarding the issue of domiciling Technical Committees in Africa. The time for actualising this proposal is now. The latest development is that the Technical Oversight Committee (TOC), charged with the responsibility of setting up TCs and coordinating their activities, has decided to form the Technical Committee on “Laterites and Lateritic Soils”. As I stated earlier, this is hosted by Ghana with Prof S. I. K. Ampadu as Chairman. In similar vein, our own Prof. Mounir Bouassida of Tunisia was appointed Vice-Chairman of Technical Committee on GeoEngineering Education.
   I wish to use this medium to repeat my earlier invitation to members from Africa Region to submit expressions of interest to join the new Technical Committee on Lateritic Soils. We owe it as a duty to make this TC succeed. The Chairman cannot do it alone! We need to cooperate with him, pull intellectual resources together and champion the cause of this first-ever Africa-hosted Technical Committee.
3. **Formation of Membership Expansion Committee.**
   The purpose of this Committee is to drive/promote membership expansion in Africa Region – New member societies, Corporate members, etc. At present, African representation on the ISSMGE Council remains the lowest among all the regions. There is need therefore to aggressively pursue a program aimed at increasing the number of member societies in Africa. A laudable idea such as this is better implemented through Committee(s) set up for that purpose. Some countries who do not yet have national societies have indicated interest in forming theirs. They need encouragement and help and this Committee is expected to facilitate the process. Furthermore, the new Corporate Membership programme of ISSMGE needs to be promoted and made more popular in the Region. This again falls under the purview of this Committee.

# ACTIVITIES OF GEOTECHNICAL ENGINEERING IN AFRICA, PRESENT (Continued)

4. **Formation of Regional Technical Coordination Committee.**

   Regional events, such as IYGEC, Regional Conferences, and TC activities are better promoted, organised and overseen by a dedicated coordinating Committee. This body needs to be set up in Africa Region to more efficiently coordinate scientific and technical activities to the greater benefit of our general membership.

***Concluding Remarks***

The above account of the present state of ISSMGE member societies and Geotechnical Engineering profession in Africa reveals that the Region has made appreciable progress in recent times. Catching up

with the developed regions is our ultimate goal. Nevertheless, that is not expected to happen overnight. The reason is easy to adduce. The world of Geotechnical Engineering is very dynamic. The advanced regions in the profession are still advancing even at a much faster rate than the so-called less-advanced regions, the list of which is topped by our dear Africa. So, parity though highly desirable, may take quite sometime to be realised if ever.

As we rejoice with the rest of the ISSMGE family on the occasion of the 75th anniversary of our esteemed professional body, our ambition is to get on board the “Geotechnical Engineering Train” and move with the rest of the world. We do not necessarily have to be at the driver’s seat, even though I would be delighted if we did. Fortunately, from all indications we seem to be already on board! And that is good news indeed.

# Future of Geotechnical Engineering in Africa (Continued)

Trevor Green
Verdi Consulting Engineers

Africa is a continent with a large number of countries, varying languages and diverse cultures. Many parts of Africa are relatively undeveloped when compared to the rest of the world, and therefore provision of basic services and infrastructure will be the focus for many years to come. Yet it is this lack of development and future potential growth that provide the greatest opportunities in the coming decades. Given the role that engineers play in economic and infrastructure development, geotechnical engineers will be vital in ensuring that Africa makes the most of it's potential, addressing the challenges that are associated with rapid economic development.

The civil engineering industry is directly related to economic growth, and therefore growth in Africa will provide both opportunities and challenges for geotechnical engineers. It is apparent that Africa's economic pulse had quickened in the last decade. Africa's collective GDP reached $1.6 trillion in 2008, with real GDP rising 4.9% per year from 2000 to 2008.

What makes this growth particularly impressive is that Africa's growth was only partially due to the commodities boom, with similar improvement in inflation, productivity and investment. Africa's average inflation rate reduced from 22% in 1990 to 8% in 2000. Productivity in Africa declined in the 1980's and 1990's, but this trend was reversed improving since 2000 by 2.7% per year. The flow of direct investment increased from $9 billion in 2000 to $62 billion in 2008.

A key driver of the growth in Africa will be the massive population increase predicted over the next 40 years, with Africa population expected to double in that period from approximately 1 billion to 2 billion people. By way of comparison, in the 1980's Africa's population was less than that of Europe's. By 2050, Africa's population is expected to be three times the size of Europe (Figure 1).

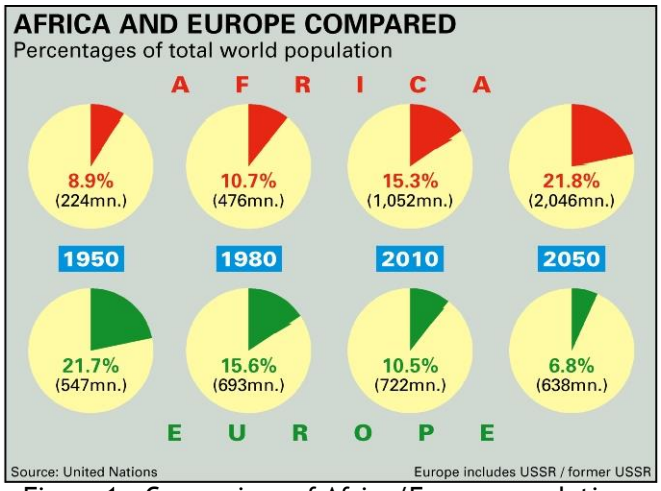


Figure 1 – Comparison of Africa/Europe populations

This economic growth and massive increase in population will have profound impacts on Africa, specifically with regards to demand on commodities and resources, urbanisation, employment, the

# Future of Geotechnical Engineering in Africa (Continued)

environment and the scarcity of skills. All of which depend on input from geotechnical engineers and the ISSMGE.

Africa is still strongly associated with natural resources and commodities, and will continue to profit from rising global demand for commodities despite the recent dip. Africa boasts an abundance of resources, including 10% of the world's oil reserves, 40% of the world's gold reserves and 80 – 90% of the chromium and platinum metal groups. Many of these resources are largely untapped due to political instability in various countries across the continent. As these countries stablise, new mining opportunities become feasible, with mining traditionally being a major source of work and projects for geotechnical engineers.

While the rate of urbanisation in Africa has increased dramatically in the last 30 years (i.e. 40% of the population urbanised in 2010, increased from 28% in 1980), the migration of people to cities in Africa still lags the rest of the world. The rate of urbanisation is expected to increase to 50% by 2030. This, along with a concurrent increase in the general population, will result in massive growth of Africa's cities (Figure 2).

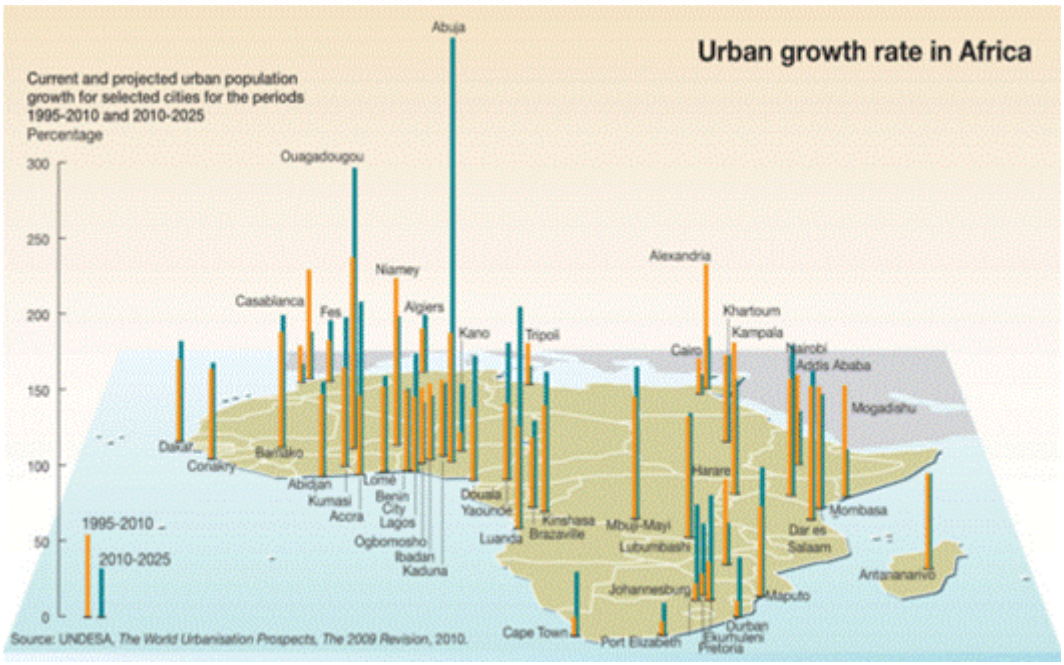

Figure 2 – Urban growth rate in Africa

As cities grow and population densities increase, space become a premium. Structures become larger and heavier, requiring more complex and expensive foundations. Large basement excavations are required with lateral support (Figure 3). More complex and expensive transport systems are constructed. The net result is demand for higher-level, more technical, geotechnical solutions and geotechnical engineers with the required expertise and experience to execute such projects.

Africa currently has approximately 500 million people of working age, and already a high rate of unemployment. The number of people of working age is expected to increase to 1.1 billion by 2040, more than China or India. Construction projects traditionally offer a major source of employment of unskilled and semi-skilled labour.

# Future of Geotechnical Engineering in Africa (Continued)

The challenge for geotechnical professionals in Africa is to provide geotechnical solutions that prioritise the use of labour, rather than follow the trend in the developed world that seeks to reduce labour through mechanisation (Figures 4 & 5). Therefore technology and methodologies that may be entirely appropriate in the rest of the world, while still effective in Africa, may not be as appropriate as simpler more labour intensive systems.

Figure 3 – Basement excavation in Johannesburg, South Africa


Figures 4 & 5 – Mechanised vs. labour intensive piling

Projects in Africa are subject to limited resources, limited availability of equipment and skills. Academic institutions are under similar pressures and constraints. Therefore the key challenge is to keep up with the rest of the world in terms of technology and skills, but acknowledge the limitations and work within them to provide the most appropriate solution for each particular project.

Africa still retains much of it's unspoilt natural beauty and wildlife. There is a need to balance desperately needed development and maintenance of the existing environment. While geotechnical engineers may only play a small role, the effect of our industry on the environment cannot be ignored and

# Future of Geotechnical Engineering in Africa (Continued)

needs to be factored into design and research wherever possible. For example, the use of stone columns or a soil raft versus piling. Alternatively the use of geothermal foundations versus conventional foundations.

Similarly the development of Africa should not be achieved while compromising on safety. While geotechnical engineers may not necessarily be directly involved in this aspect of construction, many of the structures designed or recommendations provided by geotechnical engineers carry significant risks in terms of potential injury or loss of life. Lateral support failures, slope failures, landslides, sinkhole formation can all result in catastrophic consequences (Figure 6). As the growth in Africa accelerates in the coming decades, the already scarce skills in the continent will be stretched. The ISSMGE and member societies need to ensure that work appropriate for geotechnical engineers remains the preserve of such engineers, and people not qualified or adequately experienced to conduct such work are prevented from making the critical decisions on geotechnical engineering projects.

It is clear that Africa faces many challenges, both currently and in the near future, during what will hopefully be a period of unprecedented growth and economic development. One of the key aspects to mitigating these challenges is the involvement of suitably qualified and experienced engineers. There is already a shortage of skills in Africa, particularly in engineering, which requires a concerted effort to improve the education of current and future engineers.

ISSMGE needs to be part of this education process. There are currently 11 member societies in Africa, out of 50 countries, and most of these member societies are relatively small. In order for Africa to meet demand for appropriately trained geotechnical engineers, the ISSMGE must get more involved in Africa, and Africa must get more involved in the ISSMGE.

Figure 6 – Collapsed retaining wall

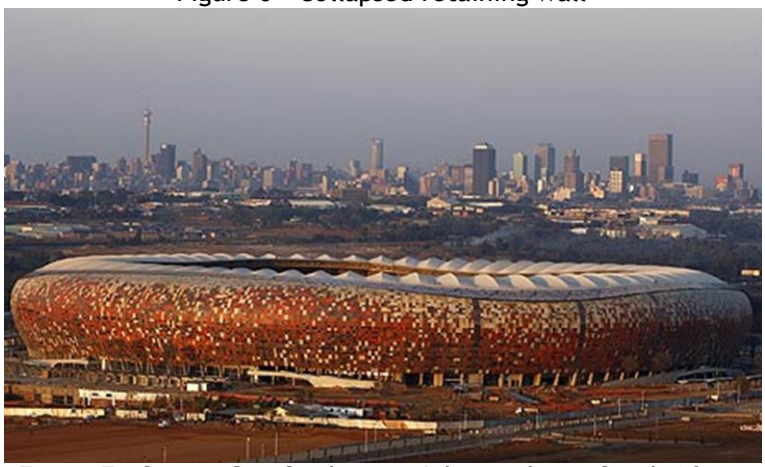

Figure 7 – Soccer City Stadium in Johannesburg, South Africa