

DAM ENGINEERING – Now is Africa's time to lead



Dirkie van Rensburg

Director of the Institute for Water and Environmental Engineering at Stellenbosch University, Prof Gerrit Basson, has been elected to represent Africa as Vice President on the Board of the International Commission on Large Dams (ICOLD). Lani van Vuuren spoke to him about opportunities for water resource development in Africa.

South Africa has been extensively involved in the activities of ICOLD since it became a member of the organisation in 1965. A non-governmental organisation, ICOLD was originally founded in 1928. With 90 national committees and over 10 000 individual members, it is the leading international forum for knowledge and experience exchange on dam engineering. According to ICOLD's website, the organisation leads the profession in ensuring that dams are built safely, efficiently, economically, and without detrimental effects on the environment.

Prof Basson is the fourth South African to hold the Vice President position, following in the footsteps of Drs JP Kriel, Theo van Robbroeck, and Paul Roberts, all formerly of the

Department of Water Affairs. Dr van Robbroeck went on to become President of the organisation. Prof Basson was nominated for the Vice Presidency by the Nigerian Committee on Large Dams. His nomination was uncontested.

Prof Basson has 25 years' experience, mainly in river hydraulics and sedimentation as well as the design of hydraulic structures. He has worked in 17 countries (excluding South Africa). He is a registered professional engineer. Prior to his election as Vice President, Prof Basson served as chair on the ICOLD Reservoir Sedimentation Committee, among others. He has been involved as editor or co-editor in a number of ICOLD Bulletins (state-of-the-art technical documents) related to reservoir sedimentation and authored several papers. He has also served as the ICOLD representative on the UNESCO-IHP-ISI International Sedimentation Task Force, while serving as Vice President of the World Association of Sedimentation and Erosion Research. The World Bank has also invited him on several occasions as specialist advisor on reservoir sedimentation on international projects.

Africa is experiencing a period of bloom at ICOLD. Newly-elected

President Adama Nombre is from Burkina Faso and, according to Prof Basson the annual meetings, technical committees and conferences held by the organisation are generally well attended by members from Africa.

This is no wonder. Africa is currently experiencing high economic growth rates despite the global recession. The International Monetary Fund projected GDP growth for sub-Saharan Africa for 2012 is 5,4%. Some of the countries with high economic growth rates in 2012 are Zambia (7,7%) and Mozambique (8,1%). This is coupled with a growing demand for water and associated infrastructure. A need for especially hydropower dams has been identified.

The largest project in the southern African region at present is Phase 2 of the Lesotho Highlands Water Scheme, which includes the proposed Polihali Dam and transfer tunnel. Other southern African schemes include the 73 m-high Metolong Dam currently under construction in Lesotho, as well as proposed hydropower projects in Mozambique where the aim is to increase the current 2,4 GW capacity to 8,4 GW.

These and other proposed water resource development schemes make the present an exciting time to be part

of the field of dam engineering, notes Prof Basson. Of course, as he points out, these developments have to be undertaken sustainably. "As engineers we have a responsibility to make sure any new dam's benefits are optimised with consideration and measures to limit the environmental and social impacts of the dam on the surrounding environment."

South African dam engineers are playing no small part in water resource development projects on the continent, including in their own country and that of the country's neighbours. They bring expert knowledge in, among others, dam design technology and construction, assessment of the impacts of infrastructure on downstream ecosystem and Reserve determination, environmental and social impact assessments, dam surveillance and safety, hydraulic design and modelling of spillways, to name but a few.

Despite these advancements, Prof Basson sees greater scope for involvement of African countries in ICOLD. "Most countries on the continent have dams serving various needs, including hydropower, irrigation, flood mitigation and potable water supply. Many countries, however, are not ICOLD members due to lack of information or for financial reasons, for example." Prof Basson hopes to address some of these issues during his term of office to make it easier for African countries to become members.

At the same time, a need has been identified to update the ICOLD dam register for dams in Africa. ICOLD's World Register of Dams is recognised internationally as the best available database of dams in the world. Unfortunately data on Africa's large dams are often lacking and/or found to be inaccurate.

Key staff in National Committees of African member countries will be identified to check the accuracy of the existing register data, and to update available information. "For data from non-ICOLD member countries, a regional approach will be followed to obtain contact persons in these

countries who would be willing to collaborate with ICOLD in providing the data," notes Prof Basson.

He also sees an important role for ICOLD to be played in regional water resource development and planning in Africa. "Due to political and social reasons, African countries have a poor track record of regional planning and sharing of the long-term benefits of water resources development. Apart from building technical expertise, ICOLD can play a role in regional planning and operation of dams and related schemes in Africa."

This could be achieved by regional workshops, which could also tie in with the annual Africa Regional Club symposium to be held in Africa. Regional clubs are formed by groups of national committees to facilitate interchange of knowledge and experience between countries with common interests and environments.

At such symposia, leading practice with regards to planning, funding, investigation, design, construction, operation, maintenance, safety review, environmental sustainability and social equity associated with dams are promoted. Exchange of information and experiences among African members on all aspects on dams will be encouraged.

Regional planning could also benefit from independent reviews by experts in the field, maintains Prof Basson. "It is proposed that an African list of dam engineering experts be compiled with an indication of qualification, experience, speciality and so on. These experts will also be



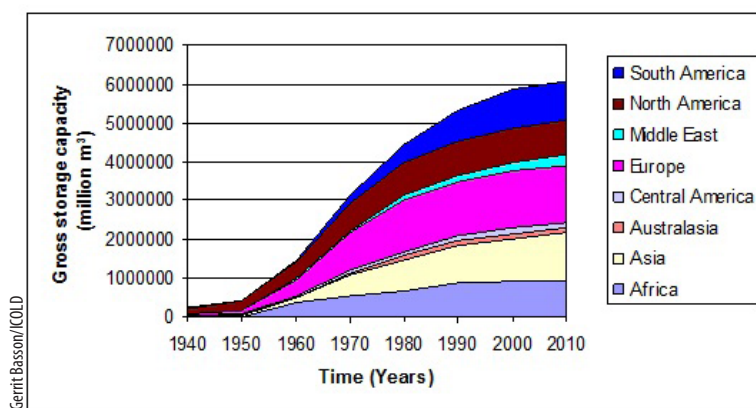
Prof Gerrit Basson,
newly elected ICOLD Vice
President for Africa.

informed of the benefits to join international experts on ICOLD technical committees during annual meetings."

To have a list of experts there needs to be experts, and building capacity in African dam engineering is close to Prof Basson's heart. "We need to encourage individuals, particularly younger people, with skills and interests in engineering, science and environmental matters associated with dams, to become active members of ICOLD and its regional organisations."

Earlier this year, ICOLD established a Young Engineers Forum for members under the age of 40, and it is hoped to build on this initiative locally and regionally. A good start is the fact that at the International Conference and Exhibition on Water Storage and Hydropower Development in Africa, to be held in Ethiopia in April next year, a session will be held specifically on the topic of capacity building.

The time has truly come for Africa to show that large dams can be developed for the benefit of all. ◻



Historical growth in
global reservoir storage
capacity. Africa still
has much scope for
development.