

THE OPERATIONS RESEARCH SOCIETY OF SOUTH AFRICA

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HISTORY OF ORSSA

The Operations Research Society of South Africa (ORSSA) was formally founded on Thursday 20 November 1969 in Johannesburg [1]. Some 150 individuals, from all over South Africa and also the then Rhodesia, were present at this founding meeting. The society is one of only a few OR societies currently active on the African continent, in fact, for many years it was the only one on the continent. It is interesting to note that the involvement of South Africans in OR goes back to World War II. South African scientists were members of the "Blackett's Circus", for example, Professors Solly Zuckerman and Frank Nabarro [1]. In addition Dr Basil Schonland, professor in geophysics at the University of the Witwatersrand, who was initially responsible for the South African efforts around the development and application of radar, later became the superintendent of the British Army Operational Research Group [2].

The use and practice of OR in South Africa has its roots in the mining industry [3] and in this regard, the Operational Research Bureau was founded by Herbert Sichel in 1952, mainly to act as consultants to the mining industry [4]. Various other large organizations embraced OR in the 1950s and 1960s in South Africa including the Defense Force, the main rail operator, and also the Council for Scientific and Industrial Research (CSIR), the largest public research establishment in the country. A South African,

RR Tusenius, attended the first OR conference held in Oxford in September 1957 [5]. With this growing interest in OR it was inevitable that this would lead to the establishment of a formal society, which happened in 1969. One of the biggest supporters and long-standing friends of the new society was Professor Patrick Rivett, a well-known, international OR personality from the University of Sussex in the United Kingdom. Rivett was present at the inaugural meeting in 1969 [1].

As indicated above, the mining industry was a fertile ground for OR applications in the early years of OR in South Africa. Whereas mining companies had strong OR groups, these all disappeared during the late 1970s and early 1980s when mining companies came under severe financial pressures. The development of OR was given a boost in South Africa when the CSIR established an OR group in the early 1960s. Many of the members of this initial group went to different universities where they were instrumental in establishing the first formal academic programs in South Africa [6]. The group at the CSIR continues to be one of the strongest OR groups in the country. Over the years, their work has involved more of consultations. OR also spread to industry, commerce, and defense. It is difficult to pinpoint a very strong sector where OR was used or is being used because of the wide variety of areas of application. A group in one of the banks was dominant at one stage; energy modeling was conducted during the 1970s and early 1980s by the CSIR together with the University of Pretoria; it is a well-known fact that in the mid-1970s a very strong group was established to conduct defense OR although little was known about what exactly the group was doing. Today there are still defense OR groups, possibly smaller than before democratization. Another noticeable area of application and a feature for which South Africa is famous, is wildlife management, including the conservation of the wildlife heritage and ecological and game range management. Considerable and

meaningful work was conducted in these areas [3,7,8]. Over the past 10 years a very strong modeling and simulation group has been developing at SASOL, the largest chemical company in South Africa, which is well known for the production of gasoline from coal. Today, this group is possibly the only such group in industry and by far the largest. A disappointing feature of OR in South Africa is the lack of OR usage in the public sector. The reasons are many but there is a general lack of appreciation of the value and potential contribution of quantitative methods and scientific problem solving.

In the academic environment, the University of South Africa (UNISA) was the first to establish a department that focused on traditional OR. This happened in the early 1970s and was by far the strongest OR university department for many years. The department has remained strong but the focus has shifted more toward financial modeling. One can find noticeable teaching in OR at various universities, namely, Stellenbosch University, the University of Cape Town (UCT), the University of the Witwatersrand (WITS), the North-West University, and also the University of Pretoria. One or two of the “previously disadvantaged institutions”, or Historically Black Universities, have relative large OR departments. In all cases except one, the departments that currently teach OR have different names such as decision sciences, statistical sciences or industrial engineering. At Stellenbosch University OR is located in the Department of Logistics. The teaching of OR at all these universities has always been dependent on the availability of suitable lecturing staff.

ORSSA exists primarily to further the interests of those engaged in, or interested in, OR activities. To achieve these objectives, it is involved in matters that concern OR practitioners in general, such as drawing up guidelines for OR education, presenting short courses and marketing OR, and providing information to the public on the nature of and career opportunities in OR. Ever since its inception, the society has had a variety of activities, initially mainly through three chapters and an annual conference, but these have been extended over the years.

Past and current activities of the society are the following:

- An annual conference is held in different parts of the country every year, usually in September of a year. The conference stretches typically over two or three days with around 70 to 80 delegates nowadays. In addition, the society endeavors to invite an international OR expert as the keynote speaker. In 1996, the annual conference was held in a neighboring country, namely, Swaziland. Joint conferences have also been held in the past with the Statistical Association of South Africa as well as the Institute for Industrial Engineers. In 2007 ORSSA also hosted the Operations Research Practise in Africa (ORPA) conference in Cape Town jointly with its national conference.
- The main mechanism of communicating with members is through a newsletter, which is published quarterly in printed format. The appearance of the newsletter has changed over the years and it is now a very professional looking newsletter.
- The society initially established three chapters and over the years, these have been extended to cover the entire country. Currently there is local representation in the form of five local chapters located in Cape Town, Johannesburg, Pretoria and two regions, namely, KwaZulu-Natal and the Vaal Triangle. All these chapters are active in one way or another.
- One of the founding members of the society, Tom Rozwadowski, died tragically with his family in 1971. In his honor, the society established the Tom Rozwadowski award, which is awarded annually for the best paper published by a member of the society.
- The society also runs a student competition annually where the best Honors and MSc students in the past year are recognized by the society in the form of a monetary prize and a certificate.
- In 1981 the first international meeting held in South Africa was a joint

- Israeli–South African conference on OR. It was held at the CSIR Conference Center in Pretoria and attracted nearly 200 delegates.
- The second international conference on “Operations Research in Resources and Requirements in Southern Africa” was held in 1984, also at the CSIR in Pretoria. This was an IFORS-sponsored event that included nine prominent international speakers.
 - In 1985 ORSSA established its own bi-annually published journal, ORiON. The journal has developed over the years to a quality publication with a high standard and an international advisory board. Volume 25 Number 1 has just been published.
 - A very successful Multi-Criteria Decision Making (MCDM) conference was held in January 1997 in Cape Town. Some 170 people, mainly international delegates, attended the conference.
 - The fourth International Conference on OR for Development (ICORD) was organized by ORSSA in May 2001 in the Kruger National Park. People from 14 countries attended. Although it was a very small conference it was nevertheless, a very successful event.
 - ORSSA initiated a project “OR into Africa” that endeavors to establish a community of OR workers in the development arena within South Africa.
 - In addition, ORSSA was also involved in assisting the East African OR fraternity to organize its first OR conference and to establish its own society.
 - Arguably the highlight of ORSSA’s existence was when the society’s bid to host the 18th triennial conference of the International Federation of Operations Research Societies (IFORS) was accepted by IFORS. This conference was held in July 2008 at the International Convention Center in Sandton and was, by all accounts, a very successful conference.
 - ORSSA has its own website at the following address: www.orssa.org.za.
- The society is managed by an Executive Committee that *inter alia* consists of a President, who serves for two years, a Vice President, Secretary, Treasurer, two additional members, the editors of the newsletter and journal, respectively, as well as the business editor of the journal. They meet on a regular basis to conduct the business of ORSSA.
 - A number of honorary memberships of ORSSA have been awarded over the years and include Herbert Sichel, Pat Rivett, Gerhard Rudolph, Jos Grobelaar, Gerhard Geldenhuys, and Mike Splaine. The society also has a retired member category. At the conference in 2003 ORSSA introduced another form of recognition, ORSSA Fellows, for long-standing members and members who have over the years contributed significantly to OR in the country as well as served ORSSA in various ways.
 - ORSSA joined IFORS in 1973 while it is also a member of the Association of European Operational Research Societies (EURO) since the latter is the “closest” regional grouping of IFORS that ORSSA can belong to, given that there is no African grouping.
- All the activities of ORSSA are conducted through voluntary service of members. The membership of ORSSA is relatively small and although the number fluctuates, there are around 300 members mainly in South Africa but also from other countries. It is however, true that there are many more people practicing OR in South Africa but many of them tend to associate themselves with their functional areas of work such as industrial engineering, finance, supply-chain management, information systems, etc.
- A few additional interesting aspects of the society are firstly that the society’s constitution drafted at its inception included specific prohibitions against any discrimination on the grounds of race, gender or creed. This was done at the height of the institutionalized apartheid era [6]. Secondly, members of ORSSA have been involved in international activities, for example, one member was a Vice President of IFORS (Theo Stewart),

an ORSSA member was the editor of the IFORS newsletter for developing countries and is also the current editor of the IFORS newsletter (Hans Ittmann). The chairperson of the adjudication committee for the IFORS prize for developing countries during the past two IFORS conferences is an ORSSA member (Paul Fatti) while a South African entry to this prize has been runner-up on three occasions. One of the more recent Presidents of the International Multi-Criteria Decision Making Society is a member of ORSSA (Theo Stewart). Members from ORSSA regularly contribute to IFORS and EURO conferences although the numbers are small. There is also some involvement with working groups of EURO. The majority of ORSSA members who publish tend to publish in ORiON, the local journal, although a limited number of papers are published in international OR journals. A few books authored by ORSSA members have been published over the years. Another highlight of the South African society was when an entry from the South African National Defence Force (SANDF) won the prestigious Franz Edelman award in 1996. This was for excellent work on “determining the size and shape of the SANDF”, given the absence of a conventional military threat [9]. Support from President Nelson Mandela, then President of the country, in the form of an accompanying letter, cannot be underestimated!

From the above, it is clear that ORSSA is an active society. It is struggling with problems similar to those elsewhere in the world, where it is difficult to retain the more junior members and those finishing at universities.

Presidents of ORSSA to date are listed as follows: Dr H Sichel (1970), Mr JW Grobbelaar (1971), Mr D Masterson (1972), Dr G Rudolph (1973), Mr J Miller (1974),

Mr K Sandrock (1975), Mr HID du Plessis (1976), Mr R Eales (1977), Prof TJ Stewart (1978), Prof JS Wolvaardt (1979), Dr MJ Venter (1980), Dr AH Money (1981), Mr M Splaine (1982), Mr D Masterson (1983), Prof LP Fatti (1984), Mr DW Evans (1985), Mr MA de Vries (1986), Mr HW Ittmann (1987), Prof G Erens (1988–89), Ms A Pachyannis (1990–91), Mr LA Visagie (1992–93), Mrs E Ferreira (1994–95), Dr E Dixon (1996–97), Prof JW Hearne (1998–99), Dr PduT Fourie (2000–01), Mr HW Ittmann (2002–03), Prof WR Gevers (2004–05), Mrs MF Harmse (2006–07), Prof VSS Yadavalli (2008–09).

REFERENCES

1. Geldenhuys G, Rudolph G. A brief history of the beginnings of operations research in South Africa; 2006. www.orssa.org.za.
2. Austin B. Schonland: scientist and soldier. Johannesburg: Institute of Physics Publications and Wits University Press; 2002.
3. Fatti LP. Current practice of operational research/management science in South Africa. *Omega* 1988;16(3):181–187.
4. Sichel HS. Operational research in South Africa. *Bull Int Stats Inst* 1957;35:391–392, 394.
5. Page T. First International Conference on operations research; 1957 Sept 2–5; Oxford, England. *Oper Res* 1957;5:863–871.
6. Stewart TJ. OR practice in South Africa. *Eur J Radiol* 1995;87:464–468.
7. Hearne J. African OR adventure. *OR/MS Today* 1994;21:50–53.
8. Hearne J. Hunting for Profits. *OR/MS Today* 1999;26:40–43.
9. Botha S, Gryffenberg I, Hofmeyr FR, *et al*. Guns or butter: decision support for determining the size and shape of the South African National Defense Force. *Interfaces* 1997;27:7–28.