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Editorial

At the time of writing, the Covid-19 pandemic is peaking in South Africa and around the world. Apart from the hardship and anxiety, the Covid-19 pandemic has caused communities and societies, it has also exposed the vulnerability with which contemporary societies around the globe are faced. Insufficient preparation and a lack of timely government planning and day-to-day good governance practices mean that health services around the globe – from Russia to the United States, Iran, Italy and, yes, to South Africa – have left states and their citizens exposed, and endangered the lives of the citizens. Two lessons from the pandemic so far have been that it is impossible to replace good and sustainable government planning, and that having the wrong people in central government positions will end up costing lives and destroying the livelihoods of the many. Despite the fact that a virus such as Covid-19 is 'democratic' in nature, i.e. it hits and infects across race and class, the reality is that the poorest and most vulnerable in society suffers most. That bad governance and corruption cost lives is well known and well documented, but the Covid-19 pandemic has laid bare the consequences of these policies or, more precisely, the lack of good government practices. In that respect, South Africa is not any different from a number of other hard-hit countries around the world. The question is how much damage has been done in process, how long time will it take to recover, whether the people in power have learned from their mistakes or from the mistakes and corrupt practices of their predecessors, and whether they are willing to address the causes of the weaknesses exposed by the crisis.

Another issue that has been highlighted by the crisis is the 'securitisation' of health, which is a widespread phenomenon around the world. This is seen through the implementation of emergency measures and laws, setting aside normal political principles. During a pandemic, this is what is to be expected from government in the attempts to curb the threats posed by the virus. The challenge and test of government intentions will be seen by how government asserts itself during these times of emergency, and especially how it constantly, ideally tries to de-securitise the situation as soon as possible and bring the situation back to 'normal' political dynamics. It is a delicate balance to strike for government, since securitising an issue – setting aside normal democratic principles and individual liberties – comes with a big responsibility, and time will tell whether governments in some instances went too far in their responses. Where is the reasonable balance between closing the economy to stop the spread of a virus, and then destroying people's livelihoods in process, potentially causing a string of other health and social problems that we know follow with poverty. Time will make judgement on the political decision-makers.

In this issue of *Scientia Militaria*, Vol. 48, No. 1, 2020, the articles draw on history to examine and consider contemporary issues around war and conflict, political oversight and liberal political ideals, or to focus on the interface between the military and civilian spheres. The articles individually and as a combined body provide an essential source of influence for all involved in military planning, education, operations and management.

Wilhelm Janse van Rensburg et al. in their article show how the South African liberal democracy from the late 1990s until 2013 was increasingly challenged and under pressure due to parliament finding it gradually more difficult to conduct effective parliamentary oversight in relation to South African foreign deployments. That this is still an issue and emphasising the importance of this contribution have recently been highlighted in parliament once again, when senior military officers failed to understand and accept this exact role of parliament.

Leopold Scholtz, in his article on the Suwalki Gap, illustrates another critical dimension of the current international political climate, and how the increased tension between the international powers, especially the United States and NATO, China and Russia, has all the potential of escalating into a full-scale war. The Baltic states have steadily felt the political pressure from an ever more assertive and aggressive Russian Federation, which – after the illegal annexation of the Crimea Peninsula and the covert military involvement in the separatist war in Eastern Ukraine – illustrates that Russia will not accept Western influence to expand further into its perceived sphere of interest, and is willing to use military power to stop this from happening. This article shows how the Suwalki Gap is one of the places where the increased political tension has the potential of turning into a full-scale war.

The article by Susan Henrico et al. focuses on the importance of GIS technology for the contemporary military commander on the battlefield. As the article on the Suwalki Gap illustrates, geography has always been important for the military planner. However, in a developing country, such as South Africa, there is a need of finding inexpensive software solutions, since the existing licensed products are financially out of reach of armies in the developing world. Henrico et al. show that existing freeware solutions offer the same functionalities as the licensed versions.

In their contribution, Roxanne DuVivier et al. show how focused self-defence training using the Gracie Defense Systems was an effective tool in preventing sexual abuse by empowering and increasing awareness amongst their research participants. This important finding illustrates that tools and techniques exist that could help curb the challenges stemming from sexual abuse and exploitation in the South African Defence Force.

In the article by Hennie Smit, the focus is on the importance of creating environmental literacy amongst deployed soldiers. The article shows that environmental literacy in the military consists of three components: military environmental attitude (i.e. the environment in which the military operates), military environmental knowledge, and military environmental behaviour. The article highlights how exposing soldiers to a dedicated military environmental management course influences their military environmental literacy positively.

In the article by Evert Kleynhans and Will Gordon, the focus is on the nature of oversight and secrecy in a modern liberal democratic state and how South Africa's illiberal past still makes research difficult. This review article focuses on the theoretical

implications of the Promotion of Access to Information Act, and uses an actual research example as a case study to illustrate the practical implications of conducting research at the Department of Defence (DoD) Archive in South Africa based on classified military documentation. The article shows that, in practical terms, it is very difficult to gain access to relevant declassified data. The authors conclude that there exists a disconnect between the applicable laws and the practical execution thereof. Both legislation and DoD Archive officials in theory appear geared towards assisting researchers and facilitating research on the War for Southern Africa, but in practice, the process is still convoluted, complicated and definitely not user-friendly.

The Editor
Thomas Mandrup

FROM BOLEAS TO BANGUI:

PARLIAMENTARY OVERSIGHT OF SOUTH AFRICAN DEFENCE DEPLOYMENTS

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Abstract

Parliamentary oversight of the executive plays a key role in ensuring accountability and is therefore central to the system of checks and balances that characterises liberal democracies. After 1994, South Africa aligned itself with liberal democratic ideals and sought to foster accountability in governance. In the South African Parliament, committees are considered the engine rooms of the institution and are central to the oversight process. Members of Parliament serving on these committees also have specific tools at their disposal to conduct oversight. These include deliberations (debates), posing written and oral questions, oversight visits, special inquiries and external audit opinions. By reviewing the use of these tools in relation to defence deployments, the study on which this article reports aimed to determine the long-term post-1994 trajectory of parliamentary oversight of deployments. The study used the timeline between Operation Boleas (Lesotho, 1998) and the Battle of Bangui (Central African Republic, 2013), two key post-1994 military deployments, as a demarcation for determining the trajectory of oversight. The study found a negative trajectory in terms of the oversight of deployments. In addition, committee meetings dedicated to deployments remained limited. Questions around deployments did not fill the vacuum left by a lack of committee activity. Oversight visits to deployment areas were limited while there was a complete dearth of in-depth analysis of deployments through special inquiries and external audits. The study subsequently noted that the negative trajectory in terms of deployment oversight cannot only be explained by the growing civil–military gap in South Africa, but arguably also contributed to it.

Keywords

Parliamentary oversight; Defence oversight; military deployments; civil-military relations

Introduction

After 1994, South Africa's first venture into the international deployment of its military commenced in September 1998. Operation Boleas, a Southern African Development Community (SADC) military intervention, saw at least 600 South African

National Defence Force (SANDF) and 200 Botswana Defence Force troops cross the border to Lesotho to address the country's deteriorating security situation.[1] Ensuing battles with units of the Lesotho Defence Force resulted in at least 11 SANDF soldiers being killed.[2] Forward to March 2013 in the Central African Republic (CAR) where approximately 200 SANDF soldiers were stationed for training of the CAR's armed forces (under Operation Vimbezela) and as a protection contingent for the training team. On 22 March 2013, the CAR's capital, Bangui, came under attack from a Seleka rebel force estimated at between 4 000 and 7 000.[3] With limited resistance from the CAR's military, the SANDF was forced to face the onslaught. The ensuing Battle of Bangui resulted in 15 South African (SA) soldiers killed and 27 wounded.[4] These two operations, 15 years apart, resulted in the most significant battle losses for the SANDF after 1994.

Operation Boleas, the Battle of Bangui and many other SANDF deployments between 1998 and 2013, occurred in the context of a democratic South Africa that saw the introduction of systems of checks and balances to ensure government accountability. The separation of powers between the executive, the legislature and the judiciary forms one of the cornerstones of the checks and balances characterising liberal democracies.[5] Key to this system is the oversight role of the Parliament of South Africa (Parliament), notably its two defence committees, the Joint Standing Committee on Defence (JSCD) and the Portfolio Committee on Defence and Military Veterans (PCDMV). Oversight of the executive reflects one of the primary functions of parliaments around the world, as it aims to ensure that a state's national resources are used efficiently and effectively.[6] Yet, the need for accountability of military deployments through Parliament was challenged early in South Africa's democratic era. Following Operation Boleas, Deiderik Perk found "parliamentary oversight unable to press the government on the actions of its defence force in times of great urgency".[7] Similar concerns were raised in 2012, with one Member of Parliament (MP) claiming significant shortcomings in defence accountability to Parliament.[8] These statements bring into question the long-term efficiency of parliamentary oversight of the military, and specifically the deployment thereof, in the context of its post-1994 liberal democratic shifts.

Research problem

Parliamentary oversight is an essential component of liberal democracy. Both the institution of parliament[9] and the act of oversight form central parts of a liberal democratic system due to their links to the concept of the separation of powers.[10] Oversight bridges two core concepts, namely accountability and transparency. The aim of parliamentary oversight is to ensure transparency in governance and to keep government accountable to the electorate.[11] Several institutions, including ombudspersons and audit institutions, fulfil the function of oversight. However, discussions on public accountability often highlight the central role of parliaments. It is argued that parliaments are effective oversight institutions because of a unique set of tools available to assist in fulfilling the oversight responsibility.[12]

Parliamentary oversight and related accountability are also vital in the context of representative democracy. Representative democracy provides a clear link between the sovereignty of the citizens and state power.[13] The role that parliaments play in bridging the divide between the electorate, whom they represent, and the military, representing a form of state power, is crucial. Through representation, parliaments play a major role in defining the relationship between civil society and the military in a state. Parliamentary oversight is critical in ensuring not only an accountable military, but also an accountable executive in terms of how the military is utilised. The key research problem in this study therefore revolved around the ability of parliaments, as institutions of representative democracy, to ensure executive accountability for the utilisation of the military and, subsequently, to serve as a conduit for balanced civil–military relations.

Aim of the study

After 1994, South Africa introduced a new constitution based on the values of freedom, civil liberties, human rights, equality, the implementation of a system of universal suffrage and electoral representation, as well as the entrenchment of a separation of powers between the executive, the legislature and the judiciary. These changes align with the fundamental building blocks of liberal democracy.[14] Oversight of executive practices by Parliament, including the deployment of the military, is therefore a key means of achieving accountability and a responsive executive as envisaged in liberal democracies.

The primary aim of the study reported here was to review parliamentary oversight of SANDF deployments between 1998 and 2013 in order to determine the trajectory of such oversight practices. In order to establish this trajectory, two lower-order questions required attention:

- First, what are the means through which parliaments can conduct oversight, including oversight of the deployment of the military?
- Second, to what extent were these means of oversight utilised in South Africa between 1998 and 2013?

Theoretical foundation and research approach

The focus of the study on parliamentary oversight of defence deployments in South Africa traversed two sets of theoretical foundations.

First, liberal democracy and its envisaged outcomes of transparency and accountability underpinned the approach of the study. Parliament as an institution, and the act of oversight, are essential to the concept of the separation of powers, a key feature of liberal democratic systems.[15] As noted, South Africa's post-1994 Constitution aligns with the ideals of liberal democracy. The 1996 Constitution and subsequent legislation and policies, such as the 1996 White Paper on Defence and the 2002 Defence Act (No. 42 of 2002), also point to efforts to ensure civil control and civilian oversight of the military. The process of parliamentary oversight in South Africa after 1994 should

therefore be viewed in the context of liberal democratic shifts to improve transparency and accountability.

Second, oversight of defence deployments is important in defining civil–military relations. Burk highlights the link between civil–military relations and liberalism by noting security of individual rights as one of the cornerstones of liberalism.[16] The provision of security, including protection from external threats, falls within this ambit of rights, and requires some form of military force. This requirement must, however, be balanced with another liberal requirement, namely that power is not abused and sovereignty remains. As such, a structure of civil control of the armed forces is necessary for democratic civil–military relations.[17] After 1994, principles of democracy underpinned South Africa's approach to civil–military relations as is evident in the 1996 White Paper on Defence, fittingly titled "Defence in a Democracy". Parliament's central role in ensuring democratic civil–military relations is reflected in the White Paper on Defence as it states the institution "has a range of significant powers regarding military affairs in order to assert democratic control over the armed forces and defence policy".[18]

In terms of methodology, the study relied mainly on secondary sources in the form of committee minutes from Parliament's defence committees compiled by the Parliamentary Monitoring Group (PMG). This is largely due to the unavailability of formal committee minutes from Parliament for the years under consideration. Context is further provided based on information obtained through interviews with nine former MPs involved with Parliament's defence committees. The information collated from these sources is presented along two thematic lines. First, a broad overview of legislation and policies in South Africa is provided to highlight the country's approach to oversight of deployments. Second, the usage of recognised parliamentary oversight tools, which are also used to oversee defence deployments, is reviewed.

The South African approach to defence deployments and oversight

South Africa's adherence to liberal democratic values in relation to the utilisation of the military is evident in legislation. Section 198(d) of the 1996 Constitution states national security "is subject to the authority of Parliament and the national executive". This immediately highlights a balance of powers in terms of the state's 'hard power'. This aim to balance power is also evident in further legislation guiding defence deployments, with specific tasks envisaged for Parliament.

Section 201 of the Constitution states that the President may authorise the 'employment' of the Defence Force (1) in co-operation with the police service, (2) in defence of the Republic, and/or (3) in fulfilment of an international obligation.[19] Later legislation – section 18(1) of the Defence Act (No. 42 of 2002) – also permits the Minister of Defence to authorise the employment of the Defence Force for service inside the Republic or in international waters.[20] These provisions are in line with directives in section 227 of the Interim Constitution (1993).[21] Existing legislation thus highlights executive dominance in terms of defence deployments, as is confirmed by Peters and Wagner noting, "South Africa to have no *ex ante* parliamentary veto power …"[22]

While *ex ante* parliamentary veto power over defence deployments is not prescribed in SA legislation, this does not imply that Parliament has no role to play. In line with efforts to ensure checks and balances, post-1994 legislative amendments make specific provision for Parliament's role in the oversight of defence deployments.

Section 201(3) of the 1996 Constitution states that, should the Defence Force be employed, the president must inform Parliament of –

- the reasons for the employment of the Defence Force;
- the place of employment;
- the number of personnel involved; and
- the period of employment.

Furthermore, subsection 18(2)(e) of the Defence Act also advises the president or minister to inform Parliament of the expected expenditure of the relevant deployment. Section 201(4) of the 1996 Constitution further notes, "[i]f Parliament does not sit during the first seven days after the defence force is employed … the President must provide the information required to the appropriate oversight committee."[23] These requirements clearly aim to provide Parliament with the relevant information to conduct oversight of the executive's utilisation of the Defence Force. This does, however, raise the question about the *ex post* powers of Parliament in terms of defence deployments.

In order to determine Parliament's *ex post* powers of deployment, two provisions of the Interim Constitution should be considered. In terms of Schedule 6 (Transitional Arrangements, Clause 24) of the 1996 Constitution, sections 224 to 228 of the Interim Constitution remain in operation. These sections have specific bearing on the role of Parliament vis-à-vis defence deployments. First, the JSCD was tasked specifically with the review of deployments. Section 228(3)(a) confirms the establishment of the JSCD while section (3)(d) notes, "[the] Committee shall be competent to investigate and make recommendations regarding the budget, functioning, organisation, armaments, policy, morale and state of preparedness of the National Defence Force …"[24] Section 228(4)(b) further highlights the importance of the JSCD in oversight of deployments by stating that, when Parliament is not in session, the "President shall summon the joint standing committee referred to in subsection (3) to meet expeditiously, but not later than 14 days after the commencement of such employment, and shall inform the committee of the reasons for such employment".[25]

Second, section 228(4) of the Interim Constitution stipulates:

Parliament may by resolution terminate any employment referred to in 227 (1) (a), (b) or (e), but such termination of employment shall not affect the validity of anything done in terms of such employment up to the date of such termination, or any right, privilege, obligation or liability acquired, accrued or incurred as at the said date and by virtue of such employment.[26]

The latter section of the Interim Constitution is crucial as it provides Parliament with a potential overriding directive for influencing defence deployments *ex post.* This approach demonstrates alignment with the envisaged post-1994 system of checks and balances and the centrality of parliamentary oversight.

Tools available for parliamentary oversight of defence deployments

Given that the post-1994 legislative scope provided for parliamentary oversight as a means of balancing executive dominance, parliamentary capacity to conduct such oversight is required. Existing literature highlights the importance of parliamentary committees in the oversight process. It is commonly held that committees are the 'engine rooms' of parliaments and that these committees contribute substantially to the effectiveness of parliaments.[27] Given the important role prescribed for the JSCD in overseeing defence deployments, it is essential to consider the tools that are available at committee level to effect such oversight.

International literature and reviews of global parliamentary practices reveal broad consensus on oversight tools available to committees. Tools most commonly referenced are committee hearings, commissions of inquiry (including ad hoc committees) as well as parliamentary questions and interpellations. These tools are evidently derived from organisational procedures and are not necessarily resulting from existing theory. They nonetheless provide accepted empirical indicators for oversight within which to locate tools for oversight of the military. Research on such oversight has been conducted by, inter alia, three reputable international institutions, namely the Inter-Parliamentary Union (IPU), the Centre for the Democratic Control of the Armed Forces (DCAF) and Transparency International.[28] A review of analyses by these institutions allows for the identification of five specific oversight tools that are central to oversight of defence, including deployments.

- *Defence committee debates*. The aim of debates is to influence a committee's collective decision on a specific aspect of defence governance. Such debates allow a unique opportunity for obtaining facts on military affairs, including deployments, from the executive or addressing defence-related aspects of major concern.
- *Parliamentary questions*. Questions from MPs to the executive can be submitted either orally or in written form. The significance of questions lies in the opportunity afforded to MPs to raise military-related concerns and receive timely responses. Parliamentary questions offer an opportunity for continuous oversight of defence deployments.
- *Special defence inquiries*. Special inquiries are characterised by in-depth engagement in terms of specific defence-related aspects. During special inquiries, parliamentary committees often engage expert opinions and may subpoena certain role players. Following an inquiry, a formal report is published. Inquiries of this nature can be done by parliamentary defence committees, multiple committees, subcommittees or ad hoc committees.

- *Oversight visits*. Oversight visits for defence purposes relate to visits by MPs (often as a committee) to military units and/or operational deployment areas in an effort to familiarise themselves with matters at ground level.
- *The use of external audit*. External audit may be outside the scope of parliaments, but could play an important role in effective oversight. Practically, this would include calling external auditors (or state auditors) to appear before parliamentary committees or requesting in-depth analysis from such auditors. Audits may include financial and non-financial aspects.

Reviewing oversight of defence deployments in South Africa

Based on the internationally recognised oversight tools available to parliamentary committees, the utilisation of these tools at committee level can be reviewed to determine the level of oversight of defence deployments. Specific attention should be paid to the role of the JSCD, given its constitutional mandate, but peripheral oversight of deployments by the PCDMV may also be considered. The review relates to committee activity on deployments between 1998 and 2013 (see Table 1 for deployments considered by Parliament).

Defence committee debates

Given executive privilege in terms of defence deployments, Parliament is generally informed in writing of such deployments immediately after commencement. Letters from the Presidency are then published in Parliament's Announcements, Tablings and Committee (ATC) Reports and referred to the JSCD.[29] As such, committee debates around deployments occur most frequently as part of discussions around presidential letters of employment.

Operation Boleas was the SANDF's first major regional deployment, as part of a SADC regional peacekeeping force. The security situation in Lesotho decreased significantly after King Letsie III disbanded the Parliament of Lesotho, resulting in widespread dissatisfaction by opposition parties and a mutiny by some Lesotho Defence Force soldiers. The SANDF's entry of Lesotho on 22 September 1998 followed a request by the Prime Minister of Lesotho, Pakalitha Mosisili, who called for intervention by the SADC.[30] Given South Africa's post-1994 shift to a system of enhanced checks and balances, an opportunity existed to entrench in-depth parliamentary oversight of the deployment of the SANDF. However, challenges to effective oversight were immediately apparent. Parliament's ATCs reveal that the presidential letter of deployment to Lesotho was received on 22 September 1998.[31] Yet, the JSCD only deliberated on this deployment more than a month later, on 2 November 1998.[32] This was a rather extensive briefing by the Deputy Minister of Foreign Affairs, the Deputy Minister of Defence, and the Operational Commander. Nonetheless, the inaction by Parliament in the first month after deployment showed a lack of immediate oversight capacity. This sentiment was shared by an opposition MP, Mr Smit, who "thanked the SANDF for the informative briefing and stated the fact that the National Party had asked for such a meeting already on the 26 [of] October".[33]

Following Operation Boleas, the SANDF's next major foreign deployment came in the form of a peacekeeping deployment to Burundi in October 2001.[34] This operation also escaped elevated levels of oversight. According to the ATC, the presidential letter of deployment for the SANDF mission to Burundi was submitted to Parliament only two days after the deployment date of 29 October 2001.[35] On 30 October 2001, the JSCD held its first meeting, which touched on the Burundi deployment. Subsequent meetings on the deployment were held in November 2001 and March 2002.[36] While this sequence of events highlights a more structured oversight approach than, for example, in the case of Operation Boleas, concerns did emerge. The haste with which the deployment took place did not allow for thorough engagement by Parliament. A Cabinet Memorandum approving the deployment was only signed in February 2002.[37] Furthermore, in the first JSCD meeting on the deployment, MPs raised concern about not being briefed properly on the deployment and having to rely on media reports for information.[38] This process exposes that, even when constitutional protocol was followed, it did not necessarily ensure thorough oversight.

Of specific concern regarding the work of the JSCD is that, except for the limited oversight of deployments to Lesotho and Burundi, further debates around deployments were limited. Committee meetings on the SADC Mutual Defence Pact and the White Paper on Peacekeeping (1999) dealt with aspects of deployments, but not with specific deployments. These meetings were rather concerned with policy directives on deployments and skipped oversight of actual SANDF deployments. The lack of oversight is of specific concern given that Parliament's ATCs reveal several presidential letters for a number of deployments to, inter alia, Angola, Tanzania and the Democratic Republic of the Congo (DRC) (in 1998), Mozambique (1999–2001), the Comoros (2001) and Iran (2004). Thus, while the executive complied with the formal legislative requirements for military deployments by informing Parliament, the legislature did not deliberate on all of these deployments.

Parliament saw an important shift in focus from legislation to oversight from the Third Parliament (2004) onwards. In 2004, Parliament's presiding officers noted the "increasingly important oversight role" of the institution.[39] The Strategic Plan for the Third Parliament also reaffirms the shift in focus by emphasising the institution's development of the Parliamentary Oversight Model.[40] With this institutional shift in mind and with two committees overseeing defence, the potential for quality oversight of the military increased considerably. This also raised the potential for parliamentary focus on defence deployments.

Despite an institutional shift to focus on oversight, a review of presidential letters published in the ATC after 2004, and debates on these letters in the JSCD, reveal significant shortcomings. Table 1 reflects the number of meetings held between 2004 and 2013 where such letters were considered. Visible shortcomings include the fact that several years (2004, 2009, 2010, 2012) saw no debates on deployment letters. Furthermore, on at least four occasions, the JSCD could not make a decision on deployments due to the lack of a quorum. It can therefore be concluded that the consideration of deployment letters happened only on an ad hoc basis and, when deliberated, it was often delayed in relation to the actual deployment dates.

Table 1: Meetings by the JSCD to consider presidential deployment letters 2004–2013

Year	Letters considered	Outcome
2004	None	-
2005	All external deployment[41]	Letters adopted
2006	Comoros deployment[42]	No quorum to adopt letters
	DRC deployment[43]	No quorum to adopt letters
	Lesotho deployment[44]	Letter adopted
2007	DRC and Burundi deployments[45]	Letters adopted
	West Indies, Nepal and Mozambique[46]	Letters adopted
	Uganda deployment[47]	Letter adopted
2008	Darfur and deployments with SAPS[48]	Adoption postponed
2009	None	–
2010	None	–
2011	DRC, CAR, Mozambique deployments[49]	No quorum to adopt letters
2012	None	–
2013	Deployments with SAPS and Mozambique[50]	No quorum to adopt letters
	All internal and external deployments[51]	Inconclusive, but quorum was achieved

In addition to the ad hoc consideration of presidential deployment letters, dedicated committee meetings dealing with specific SANDF deployments remained limited between 2004 and 2013. The JSCD only held two such meetings dealing with SANDF deployments – those in the DRC (2006)[52] and in the CAR (2013).[53] Over the same period, the PCDMV held three dedicated meetings related to deployments. An extensive briefing was received on all peacekeeping operations in 2004.[54] In 2005, the PCDMV received a briefing on SANDF missions in the DRC, Sudan and Burundi,[55] and in 2010, a briefing on border deployments was presented.[56] The review of letters and sporadic meetings on deployments over a 15-year period paints a concerning picture. It started in 1998 with serious concerns around oversight of Operation Boleas. Limited consideration of presidential letters of deployment is evident in subsequent years. In December 2012, the SA government made a choice not to withdraw a small SANDF training team in the CAR, but rather to reinforce them with additional forces to ensure their safety and the safety of SA weapons and equipment in the CAR. This deployment, like many before it, also escaped parliamentary oversight. The subsequent advance of the Seleka rebels and the Battle of Bangui only saw *ex post* parliamentary oversight. No progress in terms of the committee's oversight process over this period is thus apparent.

The review of committee activity above, specifically that of the JSCD as the vehicle for deployment oversight, shows that the committee lacked capacity to foster robust debate. An MP interviewed indicated that parliamentary scheduling clashes contribute

to a lack of opportunities for the JSCD to get together.[57] This would, to some extent, explain the limited engagement on deployments. However, the large number of deployments not considered over a prolonged period, points to a shortcoming in the parliamentary will to engage defence deployments actively. This shortcoming is perhaps best illustrated by debates around Operation Boleas and the Battle of Bangui. Following both deployments, only one meeting was held by the JSCD. These two deployments, with significant battle losses, received scant oversight attention as opposed to other less casualty-prone deployments. Single-meeting reviews, with limited scope for debate, highlight a lack of oversight. The 2013 JSCD meeting following the Battle of Bangui illustrates this point well as, following a briefing by the Minister of Defence and one round of questions from MPs, the meeting was called to a close. Some MPs argued, "[m]embers wanted to return to their constituencies and had flights booked."[58]

Interviews with former MPs also highlight the lack of robust debate on deployments. Key challenges noted by MPs were delays in discussions of presidential letters and, where such letters were considered, these were merely 'box-ticking exercises'.[59] An MP further noted that the Chief of the SANDF or the Chief of Joint Operations was hardly ever present to be interrogated on deployments.[60] Several MPs again pointed to the lack of oversight of the Battle of Bangui in particular as illustrating the weakness of oversight of deployments and commenting that it did not contribute to a broader debate in the SA public.[61]

Parliamentary questions[62]

Parliamentary questions, both oral and written, allow MPs an alternative avenue through which to gather information and exercise oversight of defence deployments. A review of Parliament's oral and written questions revealed that 2 035 oral and written questions on defence were posed between 1994 and 2013 of which 222 (10,91%) related directly to deployment matters.[63] As a point of departure, it should be noted that, prior to Operation Boleas in 1998, questions were used to a limited extent with 25 questions related to deployments posed between 1994 and 1997. This trend continued until the end of the First Parliament (1999) after which parliamentary questions were increasingly used. Crucially, only three oral questions and no written questions related to Operation Boleas were posed in the year after the deployment (1999).

From 2000 onwards, a significant increase in the number of questions around internal and external deployments of the SANDF can be observed (see Figure 1). While some questions related to external deployments in Mozambique and the DRC, the vast majority of oral and written questions related to border safeguarding deployments and internal deployments with the South African Police Service (SAPS). Crucially though, the Second Parliament (1999–2004) saw an increased use of parliamentary questions on deployments. During the Third Parliament (2004–2009), this trend decreased significantly with limited questions posed. This trajectory of questioning is in contrast to statements by Parliament's presiding officers, namely that the institution intended on focusing increasingly on oversight from 2004 onwards. During the Fourth Parliament (2009–2013), questions on deployments also remained limited, except for 2013 when 29 questions were posed. The majority of these referred to the Battle of Bangui.
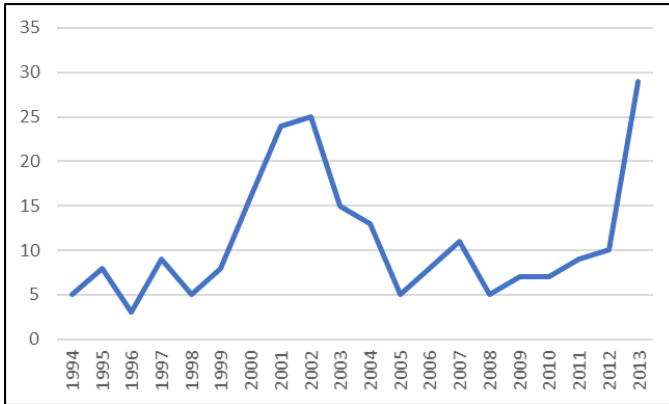
Figure 1: Frequency of parliamentary questions related to operations (1994–2013)

Further analysis of parliamentary questions raised two additional concerns regarding accountability for deployments. First, the number of oral questions related to deployments decreased significantly over time (see Figure 2). From 1994 to 2002, most questions on deployments were posed as oral questions to a member of the executive during a sitting of the houses of Parliament. From 2002 onwards, most questions related to deployment were posed in written format. This is significant as it raises the concern that members of the executive were not brought before the houses of Parliament to answer regularly on deployments. For example, only three oral questions on the SANDF's involvement in the CAR were posed in 2013.
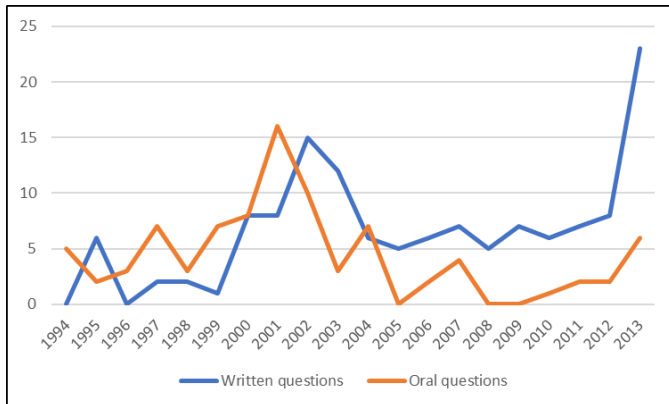
Figure 2: Written and oral questions on defence deployments (1994–2013)

Second, a review of questions on defence deployments reflected a significant disparity between questions posed by MPs from the ruling party and those from opposition parties. Of the 222 questions related to defence deployments between 1994 and 2013, only 32 (14,41%) were from MPs of the ruling party. Furthermore, notably after 1998, the majority of questions put forward by MPs from the ruling party were oral questions. From 1998 to 2013, ruling-party MPs posed 26 questions related to deployments of which 23 (88,46%) were oral questions. This is significant as it reveals that, except through formal sittings of the houses of Parliament, MPs from the ruling party showed little willingness to question the executive on deployments. This also undermined an effort at continuous oversight achievable through written questions. This approach was particularly evident in questions around Operation Boleas and the Battle of Bangui. Ruling-party MPs posed no oral or written questions related to these two deployments.[64] In-depth inquiry on deployments was therefore left to opposition MPs.

Context on the use of parliamentary questions is important. An MP interviewed noted that the limited utilisation of questions by ruling-party MPs is generally a function of politics and not a function of work ethics, as it is normal for ruling-party MPs not to reflect overly negative on departments. It is thus a self-imposed restriction.[65] Other MPs noted that increased focus on social spending and economic development took the focus away from defence and may have resulted in a decrease in the number of questions asked.[66] While the above reasons offer mitigating circumstances for the low number of questions posed by ruling-party MPs, some MPs stated that the low number of questions asked was directly related to a lack of political will to conduct oversight. They argued that written questions were generally not forthcoming from ruling-party MPs largely due to party loyalty.[67] The differentiation between Parliament and the executive thus became convoluted and accountability suffered.

Based on a review of parliamentary questions, it is evident that this tool was not optimally utilised to oversee deployments. Questions remained limited, except in the Second Parliament, and did not show continuous oversight efforts. Limited oral questions reflect poor levels of engagement with members of the executive through the houses of Parliament, and ruling-party MPs showed limited interest in oversight of deployments.

Oversight visits

Interviews revealed that MPs generally perceive oversight visits as a positive oversight tool and that they find conducting such visits to be constructive.[68] The value of oversight visits in terms of deployments of the SANDF is that MPs come into contact with the operational realities of deployed forces. This, in turn, shapes questioning to departmental officials and, ultimately, parliamentary recommendations.

The Rules of the National Assembly (Rule 61) note that a report should be submitted to the National Assembly by any committee on its activities, including oversight visits.[69] For an oversight visit to have an impact, the publishing of a committee report is thus a prerequisite. However, a review of Parliament's ATCs, in which oversight visit reports

are published, showed limited engagements related to deployments. Between 1998 and 2013, only two tabled reports dealt directly with oversight of deployments. First, in October 2005, a joint PCDMV/JSCD oversight visit to SANDF forces deployed in the DRC was conducted.[70] Second, in April 2010, the PCDMV conducted an oversight visit to various border areas to review border safeguarding deployments.[71] Other oversight visits may have related indirectly to defence deployments. For example, in 2001, the PCDMV and JSCD jointly conducted an oversight visit to Nigeria focusing on, inter alia, peacekeeping in Africa, force preparation, border control and parliamentary oversight of the military.[72] In 2011, the JSCD conducted an oversight visit to Pretoria, which included a briefing by the Chief of the Navy on the threat of piracy.[73] In 2013, the PCDMV visited various military bases around the country.[74] While aspects related to deployments formed part of the latter oversight visits, it is crucial to note the limited number of oversight visits dedicated specifically to deployments or taking place in deployment areas. This resulted in a lack of first-hand knowledge of perilous and expensive SANDF operations as well as a limited first-hand understanding of force preparation.

The concepts of deployment and force preparation are highly intertwined. The JSCD has a special role to play as section 228(3)(d) of the Interim Constitution provides specifically for the committee to oversee the "state of preparedness of the National Defence Force".[75] The value of oversight visits to understanding force preparation was highlighted in, for example, the JSCD's 2005 Report following its visit to the DRC. During this visit, observations were made regarding the function, logistics and discipline of the SANDF, and practical challenges faced.[76] Despite the value of such visits, it is crucial to note the limited extent to which the JSCD conducted oversight visits of any kind between 1998 and 2013. A review of JSCD activities revealed that almost all its oversight visits occurred in the time of the Third Parliament (2004–2009).[77] The dearth of oversight visits by the JSCD was raised as a concern by MPs during the Fourth Parliament (2009-2014). At a meeting on 12 June 2013, MPs from the ruling and opposition parties highlighted "the importance of this committee going out to do oversight".[78] MPs also expressed frustration with the long process of receiving approval for such visits. The non-utilisation of oversight visits to deployments is reflected in the fact that no deployment-specific oversight visits followed Operation Boleas and neither did any such visits take place in the years preceding the Battle of Bangui.

The broader context of the utilisation of oversight visits as an oversight tool is also important. The tool was used with increasing regularity in Parliament, specifically since the Third Parliament (2004). For example, between 2004 and 2013, the PCDMV conducted ten oversight visits and the JSCD, a total of three. In addition, these two committees conducted two external study tours.[79] However, despite oversight visits being viewed as a positive oversight tool and being utilised increasingly, such visits did not focus on defence deployments.

Special defence inquiries

Special defence inquiries are characterised by in-depth engagement in specific defence-related aspects and may include inquiries into deployments. A review of

JSCD and PCDMV activities revealed that special inquiries, either at committee or subcommittee level, were highly underutilised between 1998 and 2013. Special inquiries were only conducted by the PCDMV in relation to arms acquisitions in 1999[80] and a review of the 1998 Defence Review in 2004.[81] The JSCD conducted one special inquiry into the language policy of the Department of Defence in 1999.[82] Of these, only the PCDMV's 2004 inquiry into the Defence Review touched on aspects related to deployments, largely associated with the deployability of HIV-positive SANDF members.

The lack of special inquiries, specifically by the JSCD, is of concern given the committee's constitutional directive to 'investigate' and 'make recommendations'. Concerns in terms of the limited number of special defence inquiries were confirmed by MPs who noted few inquiries and the underutilisation of subcommittees to conduct special investigations. Crucially, interviewees also highlighted that even significant military events, such as Operation Boleas, shootings in military bases and the SANDF losses in the CAR did not result in special inquiries.[83] As noted, both Operation Boleas and the Battle of Bangui were followed by one JSCD meeting each. Although these meetings did not comprise in-depth inquiries, they present stark contrasts in oversight. Following Operation Boleas, the JSCD meeting comprised a briefing by the Deputy Minister of Foreign Affairs, the Deputy Minister of Defence, the Chief of the SANDF, the SANDF's operational commander and other SANDF commanders. The briefing referred to 'weak points identified' and 'lessons learnt' by the SANDF.[84] In contrast, the 2013 JSCD meeting on the Battle of Bangui comprised a briefing by the Minister of Defence and limited responses to some questions by the Chief of the Joint Operations Division.[85] This comparison underscores the notion that not only was special inquiries lacking, but limited inquiry into the two most significant battle losses for the SANDF showed contextual regression.

The use of external audit

External audit opinions utilised by Parliament were mostly those of the Auditor-General of South Africa (AGSA). While AGSA focuses largely on auditing public sector expenditure and performance, it also produces "reports on discretionary audits, performance audit, and other special audits are also produced".[86] As such, AGSA can be called upon to provide an objective external investigation into specific deployments and provide such information to Parliament to assist its oversight function.

Between 1998 and 2003, no direct briefings by AGSA to the JSCD or PCDMV were recorded. On only three occasions did committee minutes refer to AGSA's input on the budgets of the military.[87] Ad hoc presentations to the committees were made between 2004 and 2008, also related to budgetary and performance assessments. From 2009 onwards, input from AGSA to the PCDMV and the JSCD became institutionalised with annual presentations made to Parliament on defence matters. Crucially, though, these audit options related almost exclusively to AGSA's annual audit reports on the finances and performance areas of the Department of Defence. A former MP interviewed confirmed the incremental use of the AGSA's work by Parliament's defence committees,

but also noted that this was largely limited to one engagement per year during the annual report reviews.[88] No special audits specifically dedicated to deployments were completed by AGSA and presented to Parliament between 1998 and 2013, nor was there any evidence of such audits being commissioned by Parliament.

Conclusion

South Africa's post-1994 shift to liberal democracy, notably the separation of powers, provided a platform for thorough parliamentary oversight of the executive. Parliament's oversight role became increasingly prioritised, as is evident from the growing focus on committee work and the 2004 decision by presiding officers to focus on the oversight function of the institution. Clear constitutional provisions and parliamentary rules further provide specifically for parliamentary oversight of defence deployments.

The study reported here drew from accepted empirical indicators of parliamentary oversight to review Parliament's oversight of defence deployments. These indicators reveal that JSCD and PCDMV meetings dedicated to deployments remained limited while the adoption of presidential deployment letters occurred on an ad hoc basis and were often delayed. Parliamentary questions regarding deployments did show an increase in some years, but failed to fill the oversight vacuum left by a lack of committee activity. Oversight visits to deployment areas were lacking; therefore, not contributing to MP's exposure to and oversight of deployments. There was also a lack of in-depth analysis of deployments, both in terms of special inquiries and of the work of AGSA. The absence of special investigations by committees is of specific concern in cases of importance to the SANDF's operational capacity, such as Operation Boleas and the Battle of Bangui. A lack of special investigations indicates that not even major battle losses were an incentive for increased oversight of deployments. Based on this analysis, the study found that, between 1998 and 2013, parliamentary oversight of defence deployments reflects a negative trajectory with decreasing levels of oversight over time.

The negative trajectory of oversight of defence deployments points to specific concerns around South Africa's adherence to liberal democratic values. While Parliament continues to function and provide a platform for oversight, the depth of this oversight can be questioned, as per the outcome of this study. This detracts from the liberal democratic principles of accountability and transparency. The central implication of this want of accountability and transparency is executive dominance. The notion of a true separation of powers with effective power balances between the different spheres of government thus comes under pressure. Furthermore, although not the main aim of the current study, it becomes evident that the notion of executive dominance is central to the negative trajectory of oversight. Several interviews with MPs as well as concerns regarding the use of parliamentary questions, point to a lack of political will to hold the executive to account.

The declining oversight of military deployments also has a negative effect on civil–military relations. As noted, declining oversight diminishes accountability and transparency; thus, limiting contact between the electorate (as represented by MPs) and

the military. Furthermore, while Parliament should serve as a nucleus for debate, limited information around military deployments become available due to limited oversight. The decline in oversight therefore contributes to the distancing of civil society from the use of the military. This conclusion is in line with findings by, for example, Heinecken, Gueli and Neethling who point to a growing civil–military gap in South Africa.[89] The negative trajectory in terms of oversight of deployments can therefore not only be explained by the growing civil–military gap in South Africa, but it arguably also contributed to it.
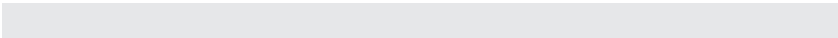
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THE SUWALKI GAP DILEMMA: A STRATEGIC AND OPERATIONAL ANALYSIS

Leopold Scholtz[1]

Abstract

This article reports on a theoretical analysis about a series of events that will hopefully never take place. Should Russia ever decide to invade the Baltic republics, the obvious invasion route would be from Russian territory into Estonia and Latvia, and perhaps also from the Russian exclave of Kaliningrad into Lithuania. Authoritative war games have found that Russian forces could reach the three Baltic capitals within 36–60 hours. NATO has decided on a counterstrategy, stationing 5 000 troops in the three republics and Poland, as well as establishing a rapid reaction force of 13 000 troops, capable of being at the front in a week. Nevertheless, this article argues that this is probably insufficient. These troops will have to move through the so-called Suwalki Gap (80 kilometres wide) between Kaliningrad and Belarus, a close Russian ally, which could be closed by a determined Russian push. The article ends with a war scenario, which shows that any clash could rapidly escalate into a general war.

Key words: NATO, USSR, Soviet Union, Russia, Kaliningrad, Estonia, Latvia, Lithuania, Baltics, Suwalki, Valery Gerasimov, Vladimir Putin

The problem

In NATO circles, considerable concern was caused by the aggressive posture taken by Russian President Vladimir Putin, especially after 2014. This followed his – according to international law – illegal invasion, occupation and annexation of the Crimea, and his covert military support for separatist rebels in the eastern Ukraine.

The general expectation was that any future aggression would come either in the Ukraine or the Balkan, or perhaps rather in the areas adjacent to the Baltic Sea. There, it is feared, Putin could try to regain control over the Baltic republics, Estonia, Latvia and Lithuania, territories that used to be part of the old Soviet Union until its demise at the end of 1991.[2] *If* – and, of course, that is a big *if* – that happens, the operational focus would fall on the so-called Suwalki Gap, the some 90 km wide gap between the Russian exclave of Kaliningrad and the nominally independent ex-Soviet republic of Belarus, a close Russian ally. It is through this gap that NATO would have to rush reinforcements and supplies from Poland to the Baltic republics, and to prevent this, Russia would have to close the gap. As we shall see, because of the specific circumstances regarding this situation, it might quickly spiral out of control once the fuse is lit.

The purpose of this article is, therefore, to present an analysis of the strategic and operational aspects surrounding the possible scenarios regarding the Suwalki Gap in the event of a Russian attempt to retake the Baltic republics. It is a theoretical analysis, which may not – and hopefully never will – play out in real life.

Vladimir Putin's grand strategy

When trying to read Vladimir Putin's mind to assess his grand strategy, several factors must be kept in mind.

First is a maxim by the British strategist Sir Basil Liddell Hart, who posed several battlefield guidelines for military commanders several decades ago. One of them was:

Take a line of operation which offers alternative objectives. For you will thus put your opponent on the horns of a dilemma, which goes far to assure the chance of gaining one objective at least – whichever he guards least – and may enable you to gain one after the other.[3]

Liddell Hart was of course writing about the operational level of war, but his words may equally apply to security strategy as well. With this in mind, let us consider the uncertainty of one pair of analysts, Michael A. Hunzeker and Alexander Lanoszka, when analysing Putin's strategy:

Many analysts emphatically insist that Russia is fundamentally revisionist. Others reject this interpretation and maintain precisely the opposite. The first camp believes that Russia harbors irredeemably expansionist ambitions and strives to reassert imperial control over the region. Though Russia is willing to use force to achieve this goal, it is content to use subversion and provocation to shape conditions until the time is right for a fait accompli. The second camp takes a more sympathetic view and portrays Russia as a defensive actor. Fear rather than imperial impulses animates Russian foreign and defence policy. Russia begrudgingly accepts that Estonia, Latvia, Lithuania and Poland are members of NATO. Yet, Russia is justifiably concerned that the United States will do everything in its power to prevent Russia from occupying its rightful place as a great power peer.[4]

A 'one-size-fits-all' military posture towards Russia in the Baltic region may be dangerously inappropriate.

Compounding the problem is that Russia's actions are entirely consistent with both narratives. For example, we can interpret Russian aggression against Ukraine as setting the stage for further expansion. But, such moves can also serve as a way for Russia to signal its red lines so as to deter future NATO expansion. We can even infer Russian intentions from the military capabilities of the country. Although Russia has invested heavily in military modernisation since 2008, its more capable military is just as useful for attacking NATO countries as it is for defending against a NATO attack.[5]

A third concomitant element is the introduction of the concept of 'hybrid warfare' (called "new-generation warfare" by the Russians[6]) by the chief of the Russian General Staff, General Valery Gerasimov. In an article in a Russian military journal in February 2013, he wrote of new methods of warfare, which he defined as –

[M]ilitary means of a concealed character, including carrying out actions of informational conflict and the actions of special-operations forces. The open use of

forces – often under the guise of peacekeeping and crisis regulation – is resorted to only at a certain stage, primarily for the achievement of final success in the conflict.

He went on, referring to "non-standard" applications of force:

The role of mobile, mixed-type groups of forces, acting in a single intelligence-information space because of the use of the new possibilities of command-and-control systems, has been strengthened. Military actions are becoming more dynamic, active, and fruitful. Tactical and operational pauses that the enemy could exploit are disappearing. New information technologies have enabled significant reductions in the spatial, temporal, and informational gaps between forces and control organs. Frontal engagements of large formations of forces at the strategic and operational level are gradually becoming a thing of the past. Long-distance, contactless actions against the enemy are becoming the main means of achieving combat and operational goals. The defeat of the enemy's objects is conducted throughout the entire depth of his territory. The differences between strategic, operational, and tactical levels, as well as between offensive and defensive operations, are being erased. The application of high-precision weaponry is taking on a mass character. Weapons based on new physical principles and automatized systems are being actively incorporated into military activity.[7]

Asymmetrical actions have come into widespread use, enabling the nullification of an enemy's advantages in armed conflict. Among such actions are the use of special operations forces and internal opposition to create a permanently operating front through the entire territory of the enemy state, as well as informational actions, devices and means that are constantly being perfected.[8]

In his testimony before the Armed Services Committee of the US House of Representatives, Christopher S Chivvis of the RAND Corporation translated the 'Gerasimov doctrine', as practiced, into three objectives:

- capturing territory without resorting to overt or conventional military force;
- creating a pretext for overt, conventional military action; and
- using hybrid measures to influence the politics and politics of countries in the West and elsewhere, which include information operations, using cyberspace, proxies, economic influence, clandestine measures, and political influence.[9]

The Russian take-over of the Crimea, part of Ukraine, may serve as an excellent example. During the night of 27–28 February 2014, heavily armed men, clad in camouflage uniforms without identifying insignia, appeared all over the Crimea. They speedily moved to seal off all Ukrainian military bases and police stations, and occupied all key points in the territory, including broadcasting centres and government buildings. President Putin feigned ignorance, saying that these were "local self-defence forces". At the same time, it later transpired, he visibly placed his nuclear forces in a state of readiness, clearly to warn the Americans not to interfere. In this atmosphere – which could hardly be called free – a plebiscite was hurriedly organised, in which an overwhelming majority of those voting indicated their approval of joining Russia. Later,

a clearly amused Putin admitted on television that the "green men", as they became known, were in fact Russian soldiers acting under his command.[10] As Ivo Daalder, former US Permanent Representative on the NATO Council, puts it, "this was no traditional military invasion; it was hybrid warfare in which goals were accomplished even before the adversary understood what was going on".[11]

Tactically, it was brilliant. By misleading and surprising the Ukraine and the West, and using overwhelming force for the crucial first 48 hours, Putin ensured that the Crimea was taken without a shot being fired. Likewise, the Russian president clandestinely sent troops to aid the separatist rebels in the eastern Ukraine. Several times, when it seemed as if the Ukrainian army could defeat the rebels, Russian forces stepped in clandestinely and bolstered the separatists.[12] At the time of writing, the fighting had atrophied into a "frozen conflict".

In 2015, Putin told an American academic, Professor Daniel Treisman (University of California), "the operation to seize the [Crimean] peninsula was 'spontaneous' and 'not at all' planned long in advance".[13] This fits in with the view that Putin is primarily an excellent tactician with an unerring eye for a gap, rather than a thoughtful strategist with a master plan. At times, he gives the impression that he would like to restore either the entire Soviet Union or, at any rate, the core areas, being the Russian Federation, the Ukraine, Belarus, the Baltic republics and, perhaps, Georgia.

The Russian speakers in the "near abroad", as the independent ex-Soviet republics are known, act as an excuse to interfere in these republics' internal affairs. Putin himself made it crystal clear, "[O]ur country will continue to actively defend the rights of Russians, our compatriots abroad, using the entire range of available means." He added, "I am referring to those people who consider themselves part of the broad Russian community; they may not necessarily be ethnic Russians, but they consider themselves Russian people."[14]

Having analysed Putin's public utterances, German political scientist Hannes Adomeit concludes that the old USSR is Putin's "conceptual point of reference", rather than "a precise geographic and geopolitical frame of reference that determine his policies". In 2008, Putin said at an international conference, "[t]he fall of the USSR was a great [sometimes wrongly translated as 'the greatest'] political catastrophe of the 20th century." And in 2011, he said the USSR was simply "Russia under a different name". To him, above all, the value of the USSR was in its status as a superpower, equal to that of the United States.[15]

Putin's tactical brilliance does not mean that he has no grand strategy. Building on Putin's public utterances, Vasily Gatov offers the following reconstruction of Putin's highly nationalist world-view:

Mother Russia is the absolute good. Positive, educated and well-behaved, it fosters the good for all the neighbors and even non-neighbors. Though sometime before Russia was humiliated and surpassed by some obscure forces, it persistently revives itself and

wants to spread the good it represents. But the entire world is ruled by illiterate others (that are also forces from the past) who persistently conspire to harm to Russia and its legitimate interests. All these others are villains by default; their goal is to dissect and destroy Russia. This is the world of negation and denial; all others are liars and hypocrites. In order to confront this terminal clash of civilizations Russia needs to employ the spiritual power of its history and faith. Russia is wealthy and resourceful and the others envy its richness and potential. In order to pursue their conspiratorial goals, others make propaganda against Russia, send spies and recruit traitors among Russians. Villains also are persistently lecturing an educated and ingenious Russia about what is appropriate and what is not. Cultured and reasonable Russia needs no lecturing from anyone. The behavior of the others shows their hypocrisy and evil goals.[16]

This, it may be reasoned, is a continuation of the idea, popular in the nineteenth century, that Russian culture is exceptional and pure, while that of the West is debased and degenerated.[17]

Putin and the Baltic states

The geopolitical situation of the Baltic states looks very different, depending on which geographical point of departure – Brussels (being NATO's headquarters) or Moscow – one uses. We shall look at Brussels a little later; let us now concentrate on the view from the Kremlin. Two interrelated factors are relevant.

In the first place, Russia lacks defensible borders.[18] This facilitated the invasions by Napoleon in 1812 and Hitler in 1941. Therefore, secondly, the real Russian obstacles to invaders are its vast spaces and the intense cold of winter. The distance between Russia's western border and Moscow is so great that even the German mechanised forces, experienced in blitzkrieg, could not reach the capital before the onset of the unbelievably cold winter weather. (Although, it must be said, Hitler's blunder in diverting his forces southwards to Kiev, slowing down the march to Moscow, also played a role.[19])

One of the reasons why Stalin placed the greater part of Central Europe under his control in the late forties was that it offered a huge buffer territory. Added to the endless Russian distances, this made any invasion by the West entirely impossible.

However, the dissolution of the Warsaw Pact (NATO's communist counterpart) and of the Soviet Union itself in 1990–1991, changed Russia's geopolitical position dramatically. Instead of the more than 2 000 km from Hannover near the intra-German border to Moscow, which invading NATO forces would have had to transverse, it was reduced to about 800 km between the border of the nearest NATO member, Latvia, and Moscow. This contributed to a feeling of insecurity in the Kremlin. In the 2015 Russian National Security Strategy, it is expressly cited as a threat.[20] As AP Tsygankov puts it:

At the heart of the Kremlin's current view of NATO is the securitized perception of the alliance as reflecting the eternally expansionist drive of Western civilization and its desire to undermine Russia as the alternative other with distinct values and international

priorities. The primary factors explaining such view of the alliance are the historically built perception of NATO and the alliance's policies following the Cold War.[21]

In an important policy speech in 2007, Putin identified NATO's eastward expansion expressly with – in his eyes – the aim of America to dominate the world. He complained about "[o]ne single center of power. One single center of force. One single center of decision-making. It is a world in which there is one master, one sovereign."[22] The old Russian fear of "encirclement" is once again alive and well in Moscow.[23]

Putin himself expressed the Russian fear graphically in a 2014 speech:

Sometimes I think, maybe it would be better for our bear to sit quiet, rather than to chase piglets in the forest and to eat berries and honey instead. Maybe they will leave [our bear] in peace. They will not. Because they will always try to put him on a chain … They will rip out its fangs and its claws. Once they've ripped out its claws and fangs, the bear is no longer needed. They will make a stuffed animal out of it … It is not about Crimea. We are protecting our sovereignty and our right to exist.[24]

As viewed from the Kremlin, the Baltic republics – and, more importantly, their membership of NATO – form a clear threat to Russia's military security. It follows that, even if the Kremlin would not actively try to neutralise them by invasion, not a single tear would be shed in Moscow if that threat collapsed.

The question is, how far would Moscow go? In the short term, it seems, not beyond covert measures to undermine Baltic independence. The presence of sizeable Russian-speaking populations in Estonia (almost 30% in 2011[25]), Latvia (25% in 2018[26]), and Lithuania (almost 6% in 2011[27]), may, however, in time provide the Russian government with a potential Trojan horse to stir up trouble. These Russian speakers are concentrated in the border regions. For instance, the population of the Estonian county of Ida-Viru is 73% Russian-speaking, and the region's largest city, Narva, has 82% Russian speakers.[28] This may then be utilised as a pretext for an invasion, much like the role the Sudeten Germans played before the Second World War to make it possible for Adolf Hitler to subjugate Czechoslovakia. In fact, the predominantly Russian-speaking population of the eastern Ukraine was utilised in exactly the same manner.[29]

It is very unlikely that Russia is actively seeking to get embroiled in a war with NATO. Vladimir Putin is not Adolf Hitler. He may rather be seen as a chess master, looking for gaps in his opponents' forces and striking only where there is a reasonable chance of success and where he can neutralise immediate countermeasures through misleading and hybrid warfare.

As Natalya Bugalyova sees it:

Putin is no mere opportunistic predator. He may not always have a clear plan and acts expediently at times, but he knows what kind of world he wants and, even more so, what kind he does not. He seeks a world without NATO, with the U.S. confined to the Western Hemisphere, with Russia dominant over the former Soviet Union and able

to do what it likes to its own people without condemnation or oversight, and with the Kremlin enjoying a literal veto at the UN Security Council over actions that any other state wishes to take beyond its borders.[30]

It is, of course, impossible at this conjuncture to predict the future. Based on what is known about Putin's political convictions and his tactical flair, it may be assumed that he will wait until a suitable opportunity arises before striking. And then any actions will start off as plausibly deniable hybrid operations along the lines suggested by General Gerasimov.

Once the Baltics are invaded, their fate is sealed. The Baltic defence forces may slow down the invaders to a limited extent, but will not be able to stop them, let alone repulse them. In a series of war games in 2014 and 2015, the RAND Corporation's conclusions were stark:

As currently postured, NATO cannot successfully defend the territory of its most exposed members. Across multiple games using a wide range of expert participants in and out of uniform playing both sides, the longest it has taken Russian forces to reach the outskirts of the Estonian and/or Latvian capitals of Tallinn and Riga, respectively, is 60 hours.[31]

At any rate, whether Russia is actively considering military action against the Baltics or not, Putin is clearly putting the West "on the horns of a dilemma".[32] According to the Russian minister of defence, Sergei Shoigu, the Russian military forces in the areas adjacent to Norway, Finland, Poland and the Baltic republics were reinforced with two divisions and three independent brigades, as well as 5 000 units of new and overhauled weapon systems and pieces of equipment. More than 350 "military facilities" were made operational.[33] In addition, the exclave of Kaliningrad (of which more later) has been reinforced with strong conventional land and naval forces and strategic missiles.[34] Several large-scale exercises in Western Russia and the Baltic Sea have honed the Russian military, should Putin decide to take the plunge.[35]

At the same time, according to a study by the Institute for the Study of War, the Russian defence force has stationed three mechanised divisions along the Ukrainian border.[36] This means that the Russians are well placed to strike wherever they want, while NATO is kept guessing as to the Kremlin's intentions.

The view from Brussels

Obviously, the view from Brussels – and Riga, Talinn and Vilnius – is very different to that from Moscow. From NATO's point of view, Russia is seen as a threat. The threat manifested itself for the first time when Russian forces invaded the (again, Russian-speaking) northern Georgian territory of Abkhazia in 2008 and converted it into a self-ruling area under Russian control.[37]

In 2013, the RAND Corporation, funded by the US government,[38] analysed the Baltic states' defence against a possible Russian invasion. The conclusion, as stated previously, was that "NATO cannot successfully defend the territory of its most exposed members", especially that of the Baltics. At the most, it would take between 36 and 60 hours for the Russian forces to reach the Estonian and Latvian capitals, Tallinn and Riga, on the Baltic coast.

Such a rapid defeat would leave NATO with a limited number of options, all bad: a bloody counteroffensive, fraught with escalatory risk, to liberate the Baltics; to escalate itself, as it threatened to do to avert defeat during the Cold War; or to concede at least temporary defeat, with uncertain but predictably disastrous consequences for the Alliance and, not incidentally, the people of the Baltics.[39]

What would NATO's response be to such an invasion? There is some difficulty to interpret President Donald Trump's position. At various times, he has said that the United States would not automatically come to the help of small states threatened by Russia.[40] This in spite of Article 5 of the NATO Charter, which expressly states, "[t]he Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against all of them", and that they will come to each other's aid if such an attack occurs.[41]

In 2017, *Time* magazine reported that the Trump administration had an internal debate:

[O]ver whether the U.S. should resist Putin in his new campaign or cede to Russia a sphere of influence in Eastern Europe. In return for the latter, the theory goes, Russia would join the U.S. in an alliance against ISIS [Islamic State of Iraq and Syria], work to reduce nuclear-weapon stockpiles and help to constrain China.[42]

Judging by what subsequently happened, this approach seems to have been abandoned, but a question mark continues to hang over the Trump government's unconditional commitment to NATO.

Nevertheless, NATO – with the apparent grudging support of Trump – has taken several measures to bolster the Baltics' defence against Russia. While the Baltics themselves have strengthened their modest military capability to 57 000 full-time soldiers and reservists (including the training of guerrilla forces to harass the Russians after an invasion[43]), NATO decided at its Wales summit in 2014 to establish a "Very High Readiness Force" of 5 000 men in the Baltics. This force – three infantry battalions, one in each of the republics and a fourth in Poland – would consist of contingents supplied by several member states and would be rotated every few months. They would serve as a kind of trip wire to slow down invasion forces and alert the rest of NATO. Then the so-called Nato Spearhead Force (13 000 troops) would be mobilised and made ready for deployment within 48 hours. It could be at the front within a week. The task of this force would then be to win time for the rest of NATO to be readied for a bigger war. Finally, they would be followed by a Very High Readiness Joint Task Force (27 000

troops), but the presence of these troops on the battlefield would not be felt before 30 days.[44] This, too, has been exercised by NATO in large-scale manoeuvres.[45] (In addition, Poland is planning to augment its present three army divisions with a fourth. The Polish government is also pressuring America to station a US division permanently on its territory.[46]) This is where the so-called Suwalki Gap comes into play.

The Suwalki Gap

The Suwalki Gap takes its name from a Polish town in the far northeast of the country, near the Lithuanian border. In order to grasp its significance, we will have to look at the geography of the region first.

Squeezed in between Lithuania and Poland, there is a Russian exclave, approximately 140 square kilometres in size, known as the *Oblast* (region) Kaliningrad, named after the capital city, Kaliningrad. The city was named after Mikhail Ivanovich Kalinin, the first head of state of the Soviet Union from 1919 to 1946. Until 1945, however, the city was the capital of East Prussia and known as Königsberg. East Prussia was a German exclave, which was divided into two sections in 1945. The southwestern half was given to Poland (then a Soviet satellite state), and the northeastern half to the Soviet Union as the *Oblast* Kaliningrad. The German inhabitants fled or were forcibly expelled.

The region was placed under the administrative control of the Russian Federation, the dominant constituent state of the Soviet Union. While the USSR existed, this posed no problem. But when the USSR fell apart at the end of 1991 into its 15 constituent republics, Kaliningrad found itself cut off from Russia, separated by the newly independent Belarus.

The existence of the region as an exclave poses strategic problems for Russia, but also has some advantages. The main problem is that its exposed position makes it vulnerable to attack and difficult to defend, unless very strong forces are stationed there. On the other hand, Kaliningrad turned out to be an excellent forward position, able to threaten both the Baltic states and Poland. And, being the base of medium-range nuclear missiles, it also threatens the Central European capitals of Warsaw, Budapest, Prague and Bratislava – and even Vienna and Berlin.

Should President Putin ever decide to take the Baltics, geography dictates an invasion from the Russian territory immediately east of Estonia and Latvia, as well as from Kaliningrad. This means that the Baltic republics may be invaded simultaneously from the east and the southwest, making any defence difficult.

If NATO theory is brought into practice, the alliance will then mobilise its Spearhead Force. While the Very High Readiness Force, together with the Baltic militaries, tries to slow down the Russian advance, the Spearhead Force will assemble along the border between Lithuania and Poland and try to hit the Russian invaders in their southern flank.

This border, about 90 kilometres long, is called the Suwalki Gap. But hitting the Russian invaders will not be as easy as it sounds. On the western side, the border ends

at the *Oblast* Kaliningrad; on the eastern side, at the Belorussian border. Belorussia is an independent ex-Soviet state, but normally stays close to Russia in its foreign policy. It is quite conceivable that the country may allow Russia to utilise its territory to help stage an invasion of Lithuania and to close off the Suwalki Gap.[47] At the same time, the Kaliningrad region at the other end of the Gap is well placed to plug the hole as well.

Any NATO force trying to get through to Lithuania and the other Baltic countries, will therefore have to fight their way through a Russian army which, in the short term, will be considerably stronger. Under no circumstances should the difficulty be underestimated.

As Professor Mark Galeotti of the Royal United Services Institute points out in a thoughtful piece,

[W]hile in the longer term NATO could use its greater aggregate troop numbers and economic muscle to grind Russia down, Moscow's forces are in a much stronger position to dominate in the crucial first couple of weeks of any European war. The Russian calculus is that there may not be a longer term, especially if it was able to threaten nuclear strikes or similarly-disabling precision conventional ones to bring a conflict to an early end.[48]

In other words, although Russia's relatively weak economy makes the country vulnerable in a somewhat longer war, its considerably stronger forces at the flashpoint give them an advantage not to be trifled with, especially if they succeed in achieving tactical and operational surprise, as they did in the Crimea.

Traditionally, NATO's operational approach has been to cede territory for time. That is, to fall back before an overwhelming Soviet offensive and to slow it down, to use that time to gather its own forces, and then to unleash a counteroffensive. However, that situation has changed – at any rate, as far as the Baltic states are concerned. Here, defence in depth is simply impossible for NATO, due to the small size of the states.

A study co-authored by a previous commanding general of US forces in Europe, Lieutenant General Ben Hodges, makes it clear exactly how important the Suwalki Gap is. Three features are identified:

• the Suwalki Gap separates the Russian motherland from *Oblast* Kaliningrad and its naval bases;
• cutting off the corridor could strangle the three Baltic states and prevent NATO aid from getting through; and
• closing the corridor "would provide Moscow with a contiguous military front between the Baltic Sea and Ukraine, consolidate its political stranglehold over Belarus, and more directly threaten Poland's sovereignty and territorial integrity".[49]

Even if Belarus does not allow the Russians the use of its territory, the Russian possession of Kaliningrad is a very strong tactical and operational advantage. While

the author of this article does not have the privilege of being privy to secret NATO war plans, logic dictates that the alliance will have to do something about the exclave very soon after hostilities break out. Nikolai Sokov, a Russian-American academic, refers to "the artillery and short-range missiles" stationed in Kaliningrad. He paints an interesting picture of the difficulties NATO forces would encounter in the Suwalki region:

Terrain is difficult and there are only two roads [as well as one railway line – LS] that allow fast reinforcement. The bottom line – Russia does not have to send tanks, as everyone fears, to prevent NATO reinforcements: it can use artillery or other strike assets to destroy the roads and keep the them closed for a fairly extended period of time. If the RAND Corporation estimate (thirty-six to sixty hours) is to be believed, then these reinforcements should arrive hours sooner, perhaps in twenty-four hours or so. If one imagines a more efficient Russian offensive, then they should be in place twelve to eighteen hours after commencement of hostilities.[50]

Besides, many railways, bridges and roads leading up to the Gap through Germany and Poland, as well as the ports in the vicinity, are – at the time of writing, at any rate – not able to handle the very heavy traffic and heavy equipment, such as tanks and artillery pieces that will have to traverse them on the way to the Gap.[51] At least one White House war game exercise found that these logistical problems resulted in a NATO loss.[52]

Moreover, a report co-authored by General Hodges, makes it clear that the vicinity is not very conducive to manoeuvre warfare:

One of the most significant takeaways: large parts of the Suwałki Corridor can be a nightmare for maneuver. The region's confined rolling fields are disrupted by chain lakes, rivers, streams, thick stands of forest, and muddy soil during rainy seasons, favoring the defender. Only two narrow roads physically connect the Polish-Lithuanian border – making for a tight and predictable funnel through which to move brigade-sized or larger formations.[53]

Of course, the NATO Response Force is mechanised. The poor physical infrastructure of the region therefore does not have to render its march up to and into the Suwalki Gap impossibly difficult. It is logical to assume that this force would carry enough supplies in its B echelon to sustain the force for at least a few days. But after that, the rear echelon will have to resupply the combat force. If too much reliance is put on wheeled vehicles, things may turn nasty. (Take into account that NATO doctrine calls for the maximum utilisation of civilian equipment, which means soft-skinned wheeled transportation,[54] which may struggle getting supplies to the Suwalki Gap region and into Lithuania.)

The Kaliningrad problem

We have seen how the Oblast Kaliningrad, being cut off from the Russian motherland, is a relatively exposed and vulnerable territory but, at the same time, a valuable forward asset. Its main value lies in the possibility of augmenting a Russian invasion into the Baltics from the east with a simultaneous advance from the southwest, of helping to close down the Suwalki Gap, and blackmailing the eastern NATO members with nuclear missiles.[55]

Any NATO general pondering how to respond to a Russian invasion of the Baltic states will necessarily have to focus on the role of Kaliningrad as well. How to neutralise that threat?

If the planned counteroffensive by the NATO Response Force to reinforce the Baltic defenders is to happen in all seriousness (as compared to an empty symbolic gesture), the threat from Kaliningrad will have to be neutralised at all costs and very quickly. Therefore, according to Sokov, a "massive increase of NATO presence in the vicinity of the Suwalki Gap should remain part of the menu of options".[56]

Another obvious course of action is to take out the Russian military in the Kaliningrad region almost from the first hour of fighting. This may entail a ground offensive to occupy the region and destroy all Russian military equipment there. However, that would be very risky in view of the considerable military build-up in the exclave and the danger of escalation, perhaps even to nuclear level. The alternative is an overwhelming air and missile bombardment to paralyse the Russian forces in the vicinity right from the beginning. In the light of the incomparably smaller risk to NATO, it stands to reason that this option would be favoured by the military and political structures of the alliance. That would, however, only be possible if the NATO forces in Poland and Lithuania are considerably strengthened, as the present forces are clearly not strong enough for the task.[57]

In the last quarter of 2018, several Western news outlets carried reports that US satellite images have picked up a considerable reinforcement of Russian military numbers and modernisation of equipment and missile facilities, including medium-range Iskander nuclear missiles, in the Kaliningrad region. One US defence official is reported to have called the reinforcement "the biggest move we've seen" in terms of the Russian militarisation of the Baltics.[58] According to another unconfirmed report, the number of Russian tanks in Kaliningrad was increased from 40 to 100 at the beginning of 2019.[59] The region also houses the headquarters of the Russian Baltic Fleet. An analysis by the Institute for the Study of War (ISW) makes it clear that an army corps (the 11th) was stationed in Kaliningrad under the command of Major-General Yuri Yarovitski. The corps consisted of two army motorised infantry brigades, a naval infantry brigade, an artillery brigade, a missile brigade, and an anti-aircraft missile brigade.[60] It is not known how many men and women in uniform there might have been, but it might well be in the range of 10 000–15 000. And this does not even include the warships and military aircraft stationed there.

In any language, this amounts to a very tough nut to crack.

A war scenario

Let us now imagine a – theoretical – war scenario between Russia and NATO in the Baltic region.[61] Given the Russian doctrinal propensity for avoiding conventional clashes in favour of hybrid warfare, it is logical to assume that Russia will not attempt a full-scale invasion after a period of increasing tension and build-up of its forces along the border. After all, that would give NATO ample warning to start countermeasures.

Instead, one may assume a lightning strike without warning. Combined with a smoke screen, figuratively speaking, to place NATO "on the horns of a dilemma"[62] and mislead the West, this would slow down any NATO response considerably. It stands to reason that the invaders would strive to stay below the Article 5 threshold as long as possible.

In an ideal situation – from Moscow's perspective – NATO could even be persuaded not to intervene at all. This was what happened in the Crimea and the eastern Ukraine – bearing in mind that NATO's Article 5 did not apply to those regions. One may assume that Russia will see to it that a plausible excuse for its own military movements is given, one that effectively paints NATO as the aggressor instead of Russia.

In the light of the Crimea intervention, one may imagine heavily armed "green men" (as they were then referred to) in unmarked uniforms popping up in the eastern regions of Estonia and Latvia adjacent to Russia, and in the western part of Lithuania next to Kaliningrad. The Kremlin says that the Baltic states are conducting operations against the Russian-speaking areas close to the Russian border. Confusion reigns in NATO capitals as intelligence services and politicians scramble to make sense of what is happening.

The "green men" are rapidly reinforced, and within 24 – perhaps 36 – hours, it is clear that they are in fact Russian troops – by which time they are well on their way to the Baltic coast and the capital cities of the three republics. The Baltic military and the NATO troops in these countries fight back valiantly and succeed in slowing down the Russian advance, but not in stopping it. At the same time, asymmetric tactics, information and cyber warfare, are used to disrupt infrastructure, as well as to increase general confusion and – most importantly – erode the resolve of those in command of the defenders. (These, it may be prudent to remind readers, were the exact results of the enormous speed of Nazi Germany's blitzkrieg tactics during the first years of the Second World War.[63])

In the meantime, NATO mobilises its Spearhead Force and rushes it to the border between Poland and Lithuania. In addition, Poland fears that the Russians will not stop at the border and orders a general mobilisation. The NATO troops, in conjunction with the Polish, move up to the Suwalki Gap. They are, however, slowed down by Russian air attacks, causing considerable casualties. Other reinforcements are brought in by sea, but are subjected to severe Russian air and naval attacks originating from Kaliningrad and the St. Petersburg area.

NATO bombers and warships unleash a concerted bombardment on Russian troops and military installations in the *Oblast* Kaliningrad, dealing the Russians a very heavy blow there. Warships clash in the Baltic Sea, but the NATO ships, being more modern and better equipped, dish out more punishment than they receive.

It is here that things may start to become very dangerous very fast. If the Russians fear that NATO may invade and occupy Kaliningrad, they may decide to escalate the war, which up to that point has been confined to the Baltic area. According to the usually very well-informed US investigative journalist Bob Woodward, Russia "had privately

warned [Defence Secretary General Jim] Mattis that if there was a war in the Baltics, Russia would not hesitate to use tactical nuclear weapons against NATO".[64] But even if that does not happen, they may very well widen the operational area by stirring trouble or even invading the Ukraine and the Balkan NATO members. If that threshold is passed, what started as a regional clash, may degenerate into a Third World War.

To prevent this scenario, a RAND Corporation study found a force of about seven mechanised brigades, including three heavy armoured brigades, adequately supported in the air and on the sea, the minimum required to defeat the Russians.[65] However, even the Spearhead Force does not provide this minimum of firepower. And that assumes that the forces reach the operational area in time to prevent the Russians from confronting NATO with a fait accompli, the effective occupation of all three states even before NATO could intervene. It is known that Russian military doctrine heavily favours a lightning offensive.[66]

As things stand at the time of writing, it does not seem as if NATO would be able to prevent Russia from occupying the Baltic states. Possession is nine-tenths of the law, the saying goes. As with the Crimea, if the Russians have possession of the Baltics, it is extremely unlikely that they will willingly relinquish it. They will most probably sit tight and wait for the storm to subside.

NATO, therefore, has two options and one hope. The first option is to continue pretending that its present countermeasures are adequate to stop and even roll back a Russian invasion, and to do nothing further. The second is to increase its defence spending considerably (politically a highly unpopular choice) and to establish ready forces strong enough to deal with Russian aggression – and to be on station in time to do it. In the absence of this, one hope remains: that President Putin will not risk a full-blown war with NATO, even one he can win in the short term. If so, it will not be because NATO's present countermeasures have intimidated him, but rather because the vulnerable Russian economy cannot sustain a war with NATO for any considerable period. Nevertheless, a seasoned observer, such as Ambassador Wolfgang Ischinger, chairman of the Munich Security Conference, writes about "our sleepwalking into a serious confrontation over the Baltics".[67] This risk is all the greater because the NATO and Russian armed forces are – according to a news report – "barely on speaking terms". The former US Supreme Commander of NATO forces, General Curtis Scaparotti, complained that the communication between the two sides has mostly broken down.[68]

As things are now, the Russian military is not suitably stationed for an invasion of the Baltics.[69] But will this last? All in all, nobody can relax.

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ENDNOTES

[1] Dr Leopold Scholtz is a retired political commentator, writing for several news media. He is also a military historian with many academic publications on his CV, and the writer of *The SADF in the Border War 1966–1989* (Cape Town: Tafelberg, 2013) as well as *The Battle of Cuito Cuanavale* (Solihull: Helion, 2016) and *Ratels on the Lomba: The story of Charlie Squadron* (Johannesburg: Jonathan Ball, 2017). He is a research fellow at North-West University's Research Focus Area Social Transformation (Potchefstroom campus). He retired as a captain in the Reserve Force of the South African Army.

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IS OPEN SOURCE GIS FEASIBLE IN MILITARY OPERATIONS?
EVALUATION BY APPLYING A USE CASE

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Abstract

The study of terrain and all its related elements and facets are of crucial importance to the military, with the importance of terrain being recognised by military leaders more than two thousand years ago. Military operations can occur at any of the three levels of war: tactical, operational and strategic, and can be a combat operation or a military operation other than war (MOOTW). Information about the geography empowers a military commander to plan and execute a mission successfully. As technology developed and evolved, geographic information systems (GIS) have come to play a major role in this. Today, a military operation without the use of GIS is unthinkable. In a developing country like the South Africa, however, licenses for proprietary GIS software, vendor-exclusive training and the bureaucracy of the procurement cycle add to the time and costs of a mission. The question arises whether open source software is a feasible alternative. Since the South African National Defence Force was initially trained in the use of proprietary software and it therefore became a strong habit, the perception now exits that Free and Open Source Geographic Information Software (FOSSGIS) products are neither mature enough nor user-friendly enough to be used in military operations. This study evaluated the use of an open source desktop GIS product, QGIS, in a use case for MOOTW. QGIS, outputs were compared to those produced in ArcGIS, a proprietary desktop GIS product developed by Esri, widely used in military operations. The user-friendliness of the two products as well as pricing was also compared. Results show that the QGIS outputs provide the operational commander with equivalent information to plan and execute a mission successfully. This implies that open source GIS is suitable for military operations, especially those with limited budgets and at short notice, such as in the case of disaster relief.

Keywords: open source software, military operation, geographic information system, QGIS, disaster relief

Introduction

In recent years, the South African National Defence Force (SANDF) has become involved in a number of military operations other than war (MOOTW). Neethling agrees that, although the military is historically "organised" for their involvement in battles on land, in the air or at sea, their scope has been expanded "to include assistance (also to other countries) in cases of natural disaster; participation in peace-support

operations; support to police forces in upholding law and order; and a role in socio-economic development". [4,5]

In this study, a use case was therefore developed in the form of an outbreak of cholera in the Pilanesberg area. The outbreak of this highly infectious disease is a very realistic scenario in a developing country such as South Africa, where sanitation problems often occur. The understanding of the terrain remains essential for planning operations even in the MOOTW role. The layout of the terrain influences the execution time of certain manoeuvres or operations,[6,7] and even communications are influenced by the terrain. Amongst others, line of sight, vegetation, topography, hydrology and human presence in the terrain and its surroundings need to be considered. Using geographic information systems (GIS) to analyse and visualise geospatial information develops an understanding of the terrain.[8]

GIS has become a requirement rather than just an advantage for militaries. Availability and access to GIS software and geospatial information are therefore imperative. Proprietary software, the bureaucracy of the procurement cycle, the cost of acquiring and maintaining software licenses, as well as vendor-exclusive training of staff in the use of the software constrain the availability of and access to GIS, thereby having the potential to reduce possible benefits of such a system to the military. By using open source software, these constraints can be eliminated. With open source software, the source code is openly shared, and new tools are often developed at a much quicker pace than in the case of proprietary software products since the development cycles are different. More advanced GIS tools can for instance be downloaded without the burden of additional costs. In the international geospatial community, the last decade has seen an increase in the development and implementation of GIS based on open source GIS software.[9,10,11]

However, in military communities, the perception seems to exist that open source GIS are neither user-friendly nor mature enough to be used in military operations. This perception is based on discussions with colleagues and many years of experience in a defence force environment, where the proposal to introduce open source GIS was met with hesitance and even resistance. The aim of this article is to demonstrate the use of an open source GIS product as a feasible alternative in military operations.

Methodology

A literature review provided insight into the precise role of geospatial information in the military, the three levels of war (strategic, operational, and tactical) and the use of GIS on each of these levels.[12,13,14,15,16] Based on this, a use case of a military operation was developed and typical GIS outputs required by the operational commander were identified. The GIS outputs were prepared in QGIS[17] (version 2.8.5-Wien), an open source desktop GIS product, and compared to the same outputs prepared in ArcGIS[18] (version 10.2), a proprietary product widely used in military, serving as the baseline.

Other research has compared ArcGIS to QGIS,[19,20,21] and there are examples of humanitarian operations using open source geospatial data and software, such as the Humanitarian OpenStreetMap Team (HOT).[22] The study reported in this article was unique, because it incorporated military operational requirements. The aim was not to

find a 'victor' in a competition, but rather to present the results of an objective study on the feasibility of open source GIS in a military operation use case.

The use case created for this study required specific GIS outputs (Tests 1 to 7, see use case). However, this study only performed Test 1 (hill shading), Test 2 (flood simulation) and Test 3 (mapping of existing infrastructure), because Test 4 (buffering an area of operation), Test 5 (hot spot analysis), Test 6 (creating a visibility layer) and Test 7 (creating a water purification plants layer) were compared in an earlier study.[23] A comparison of user-friendliness and costs are included in this article. The article is concluded with a discussion of results and conclusions.

Data collection and analysis based on the use case

TomTom Africa supplied the vector data, as well as the 20 m digital elevation model (DEM) for the study area.[24] The DEM was used to produce the required hill shading product and the angles for the light source (the sun) were set to an azimuth of 315° (i.e. degree distance measured clockwise from north at 0°) and an altitude of 45° (i.e. angle above the horizon). The remaining data were obtained from National Geo-spatial Information (NGI),[25] a component of the South African Department of Rural Development and Land Reform (DRDLR). All data were defined and projected to WGS84/UTM grid zone 35S. The data used in this study were:

- a clipped vector data set of roads, rivers, railway lines, water bodies, built-up areas and points of interest;
- a subset of the SPOT6 image and 1:50 000 raster topographical maps; and
- a 20 m digital elevation model in GeoTIFF format.[26]

The data were used to create the required GIS products by using both QGIS and ArcGIS, and the results were analysed by comparing the different products. ArcGIS is widely used in military operations and therefore served as the baseline against which to compare the QGIS results.

Study area

As stated previously, the Pilanesberg area, located in South Africa, was chosen as the study area (see Figure 1). An interesting fact about this area is that it is set in an alkaline ring complex, and it is one of only three such complexes in the world. The terrain setting is perfect for a demonstration of the involvement of the military in a MOOTW, since it is a mountainous area (which can make military communications and manoeuvrability difficult) and yet it is close to a settlement of people (where the spread of an infectious disease, such as cholera, can quickly escalate).

Figure 1: Study area – Pilanesberg, South Africa

Use case: A cholera outbreak in Pilanesberg area, South Africa

Cholera still affects many parts of the world today and is caused by drinking or eating contaminated water or food. It is often found in areas with "poor sanitation, crowding, war, and famine". "If left untreated, it can lead to death".[27] After consultation with commanders involved at different levels and in different roles in operations,[28],[29],[30],[31] a use case was developed that describes the health risk disaster relief operation in response to a cholera outbreak in the Pilanesberg area of South Africa.

The use case (presented as a fictional operational tasking) describes the GIS outputs typically required for such a military operation in the SANDF:

Because the SANDF is the only national entity with a suitable medical deployment unit capability, the Ministry of Health requests the SANDF to assist in curbing the outbreak of cholera in the rural population of the Pilanesberg area in the North-West, a province of South Africa. The commander in charge of the operation is tasked with setting up an operations room in the disaster management centre and deploying the following to manage and control the outbreak: a medical post with doctors and nurses; two infantry companies responsible for barricading and securing the contaminated area; and a squadron for installing and running water purification units. The operational commander requires the following GIS outputs to plan and execute this mission:

Test 1 – an analyse of the terrain is required, such as planning routes and selecting suitable vehicles for the terrain, so that logistics can be planned. A hill shading is required. A hill shading is a 3D view of the terrain that reveals differences in slope and height by taking into account the illumination source angle and shadows.

Test 2 – cholera spreads through contaminated water and therefore heavy rains pose a risk. A flood simulation layer is required to anticipate the influence on the spread of cholera, should water levels rise.

Test 3 – finally, a map of the area of operations and surroundings is required that shows existing infrastructure, such as roads, helipads, schools, hospitals and police stations. This map will be used to identify suitable locations for the operational headquarters (HQ), medical post, entry/exit roadblocks and helicopter landing zones.

Test 4 – the individual households reported as households with cholera were digitised by using the Spot 6 image as backdrop in order to zoom in on the residential areas. An area of 10 km around the residential areas needs to be demarcated, since this will be the 'area of operations'.

Test 5 – the high-risk cholera areas, i.e. areas with a high density of infections, need to be determined regularly in order to monitor the spread and to plan emergency treatments and evacuations of patients in serious conditions. For this, a hot spot analysis is required.

Test 6 –A hill shading is required so that the logistics can be planned. A hill shading is a 3D view of the terrain that reveals differences in slope and height by taking into account the illumination source angle and shadows.

Test 7 – communications are essential during any military operation. Radio communications work on the principle of 'line-of-sight' and therefore a line-of-sight visibility from the identified HQ and to the rest of the area of operations is required.

Results of GIS outputs based on the use case

The results of the GIS outputs that were produced from the various tests, as highlighted in the use case, are presented in this section.

Test 1: Hill shading to reveal differences in slope and height

In ArcGIS, the Hillshade tool of the Spatial Analyst extension was used (see Figure 2). In QGIS, the Hillshade tool in the collection of Terrain Analysis tools was used (see Figure 3). Both outputs were suitable for terrain analysis and assisted the commander in developing an operational plan.
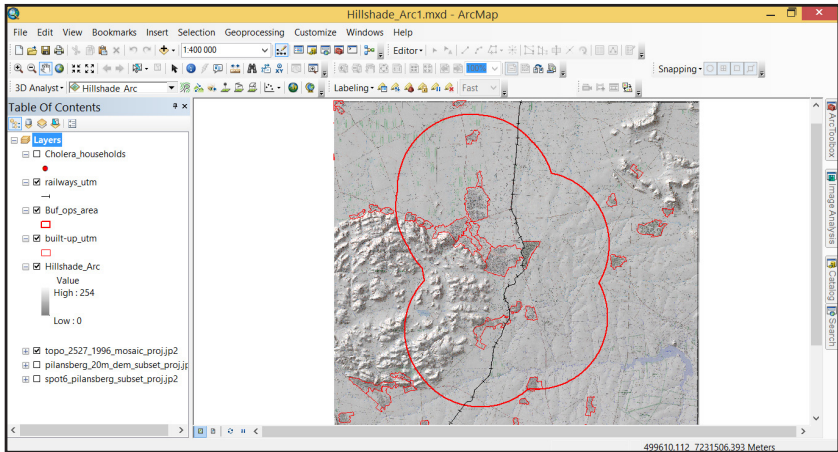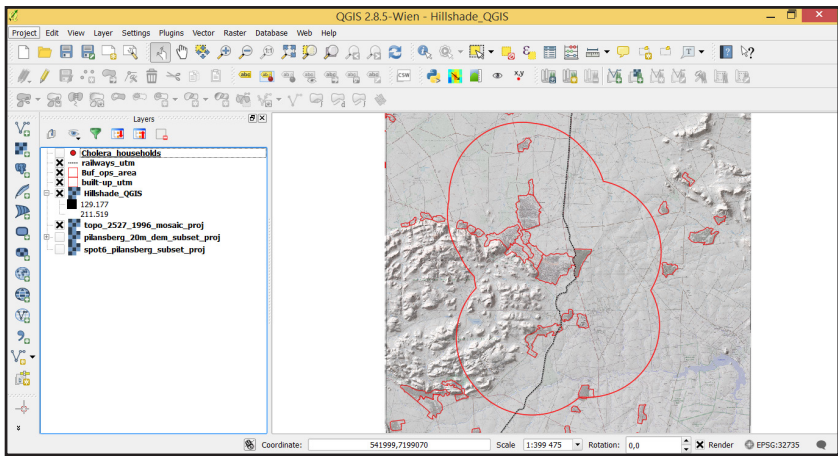
Figure 2: Terrain analysis – ArcGIS

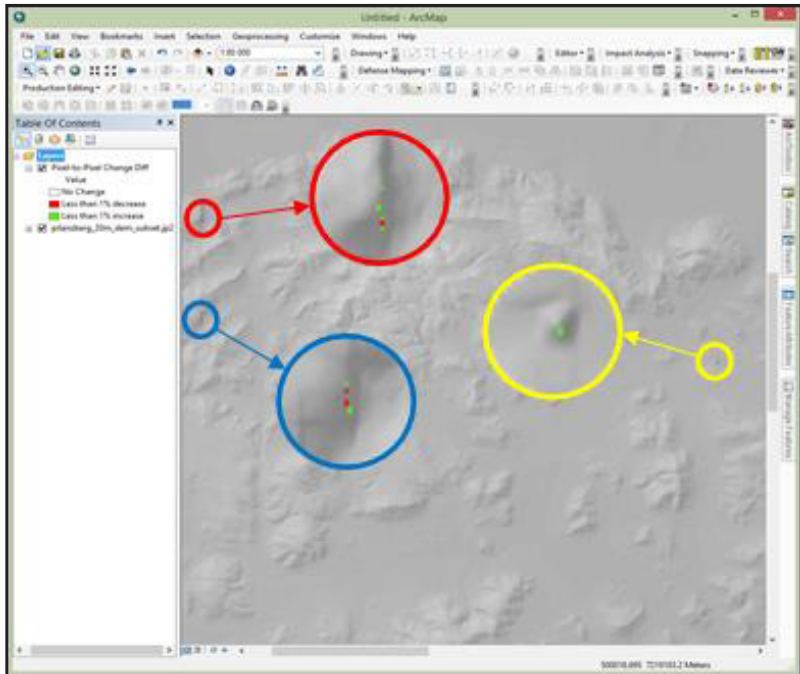**Figure 3: Terrain analysis – QGIS**

Figure 4: Hill shade analysis results comparison

A pixel-to-pixel comparison was done between the ArcGIS and QGIS outputs. It was determined that, for all practical purposes, the outputs of the two products were the same. The permissible input parameters for the illumination source were the same and therefore similar output results were achieved. However, very small differences did exist. These differences were so small that they were almost impossible to identify with the naked eye. These areas were therefore zoomed in on, and are indicated by means of the red, blue and yellow circles (see Figure 4). The comparison used the elevation source as a backdrop for orientation purposes. The pixel-to-pixel comparison shows 'green areas' that indicate less than 1% decrease changes from the ArcGIS result to the QGIS result. The 'red areas' indicate less than 1% increases. It is evident that the pixel value differences between these two software products were minimal, which is an indication that both these software products deliver good hill shading results that will be suitable for use during any military operation.

Test 2: Determining risk of cholera spread in the case of a flood

Flood lines were determined with raster-based flood simulation based on elevation. More sophisticated flood simulations and models exist, but the data for these are not always available for military operations, especially when assisting with relief operations in Africa. Flood lines were determined for one of the rivers in the area operations, namely the Mogwase River (see Figure 5).

For this test, the current height value for the Mogwase River was specified as 1 152 m above mean sea level. Flooded areas were determined should the river level rise to 1 153 m, 1157 m and 1 160 m respectively.
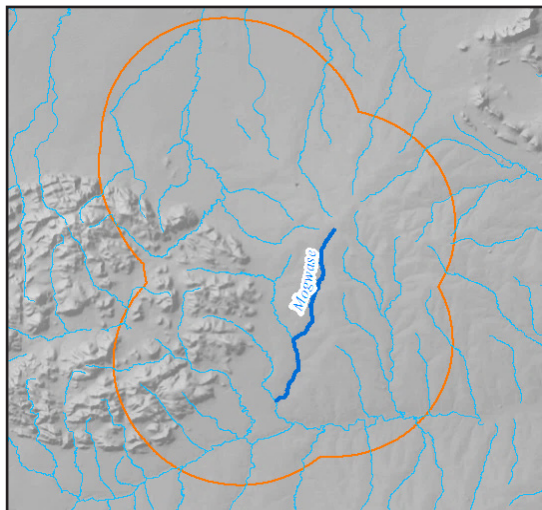
Figure 5: Mogwase River in relation to the rest of the area of operations

In ArcGIS, the raster calculator, one of the Map Algebra tools in the Spatial Analyst extension was used. The output is illustrated in Figure 6. In QGIS, the raster calculator under the Raster tab was used. The initial output is a single band greyscale image (see Figure 7), for which the styling can be adjusted for a better viewing experience (see Figure 8).
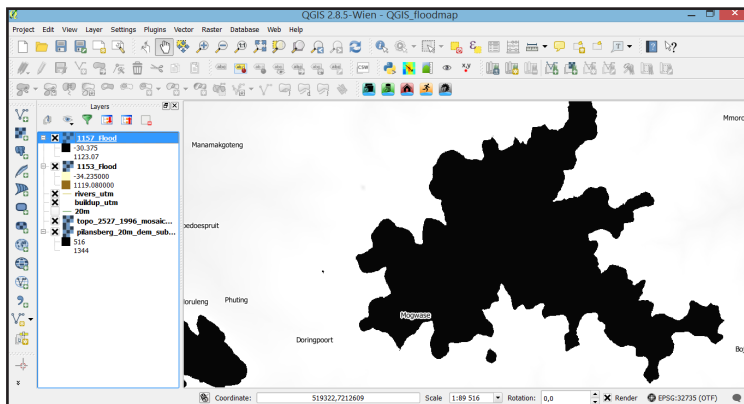
Figure 6: Flood simulation – ArcGIS
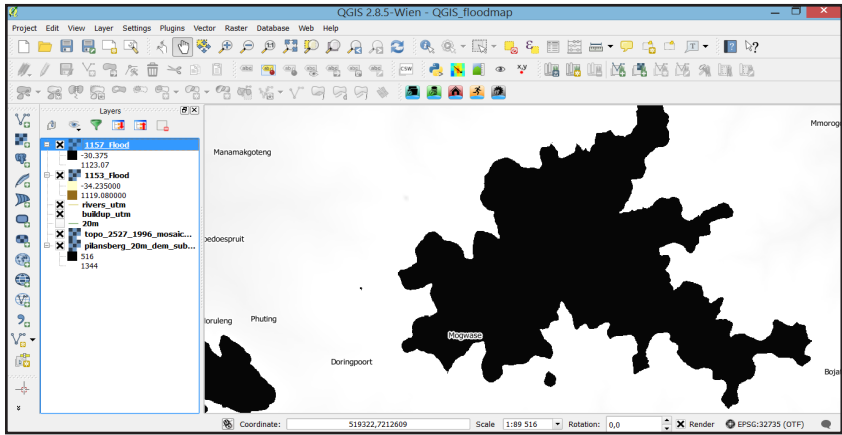
Figure 7: Flood simulation – QGIS
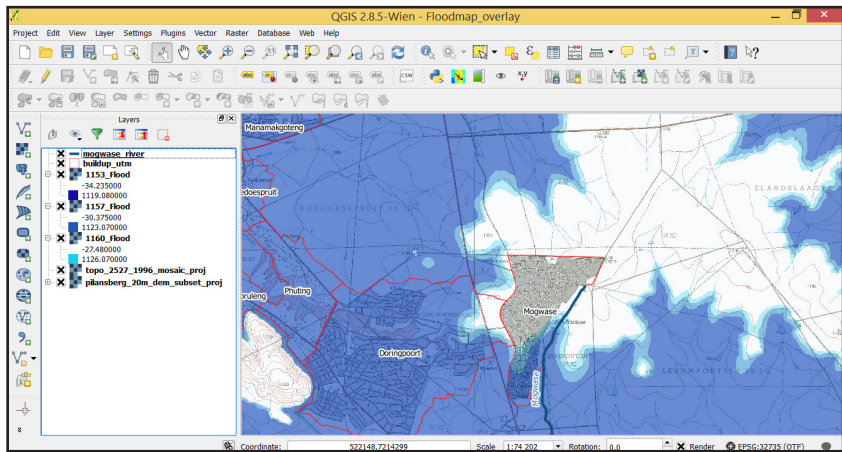
Figure 8: Flood simulation after adjusting the colours – QGIS

Figure 9 illustrates that the ArcGIS and QGIS outputs are alike. Closer inspection reveals minimal differences between the two outputs, illustrated in Figure 10: the ArcGIS outputs (light blue) are overlaid on top of the QGIS outputs (dark blue) to reveal that the QGIS layers cover a larger area than the ArcGIS layers. The average difference was measured to be ~10 m, which is not significant due to the size of the study area (approximately 935 km^2). Therefore, it could be concluded that both products produced acceptable flood simulations that the commander might use to prevent cholera spreading during heavy rains and floods.
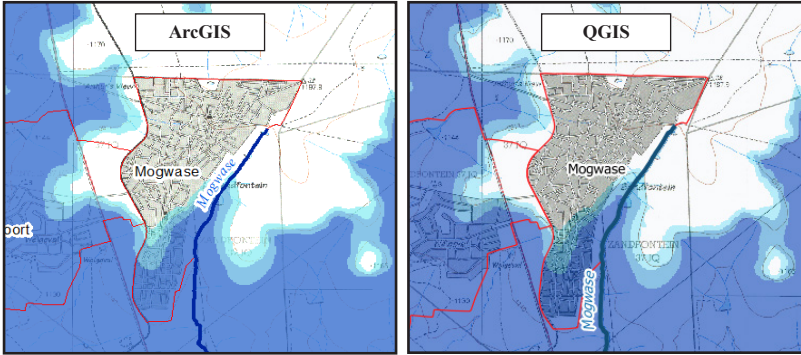
Figure 9: ArcGIS and QGIS flood simulation comparison
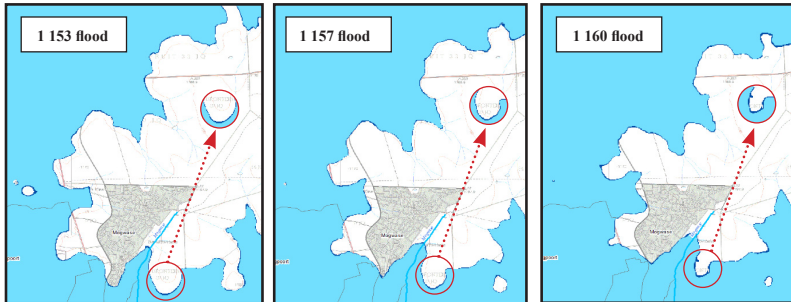
Figure 10: ArcGIS and QGIS flood simulation comparison

Test 3: Map of existing infrastructure

Maps of the transportation infrastructure, built-up areas, roads, rivers, railway lines and water bodies together with different points of interest (helipads, school, hospitals and police stations) were prepared. Symbols were styled to represent the various points of interest appropriately.

In ArcGIS (see Figure 11), styling of the points was made easy by the wide variety of symbols available in the symbol sets included with the installation. In the initial installation, the number of point symbols in the QGIS style library was limited. Additional point symbols in .SVG format were downloaded to extend the range of point symbols available in QGIS (see Figure 12). QGIS symbols are available from a wide variety of Internet sites at no cost.

The maps produced in both products could be used to identify locations for the operational headquarters (HQ), the medical post, entry and/or exit roadblocks and helicopter landing zones.
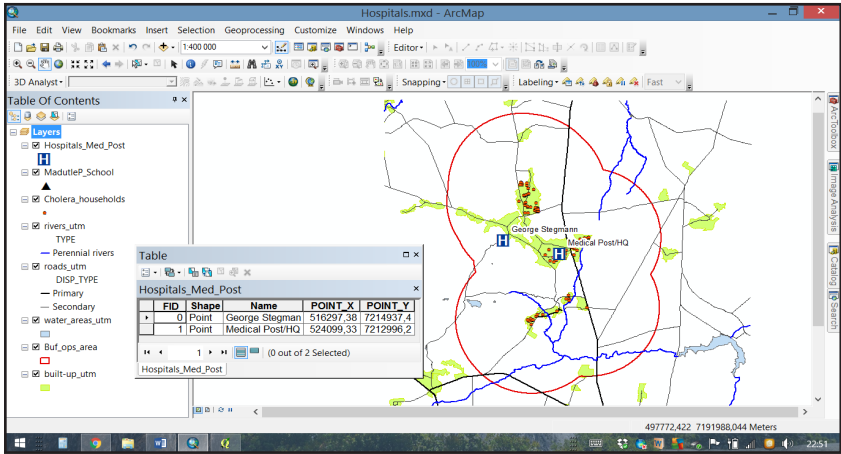
Figure 11: Map of hospitals in the area of operations – ArcGIS
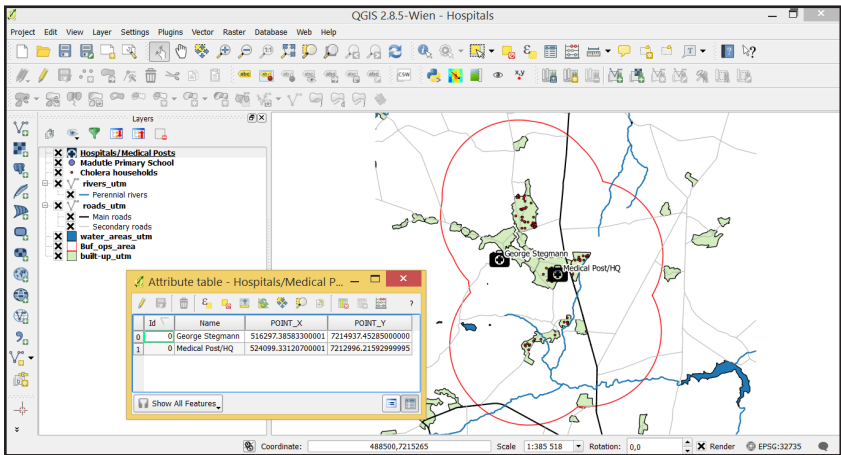
Figure 12: Map of hospitals in the area of operations – QGIS

Testing user-friendliness

User-friendliness is a very important aspect relating to GIS software acceptance since it determines the use of a product. ArcGIS and QGIS software was evaluated against the criteria as set out by Wallen to evaluate whether software products are user-friendly or not. The results were as follows:[32]

Simple to install – in order for the installation of software to be perceived as "simple to install", the process of installation should be easy to understand and well documented.[33] In terms of the cholera use case specified, the installation of software had

to form part of the pre-deployment preparation of the GIS team. The reasons for this were threefold.

- Internet access might be limited or not available in the area of operations (in this case the Pilanesberg area). Internet access is needed for the initial installation of both ArcGIS and QGIS. In the case of ArcGIS, the authorisation code should be obtained by means of the Internet. Where QGIS is concerned, Internet access is needed to download the complete software application initially. Once QGIS is downloaded, it can be saved on a storage device and installed at a later stage.
- Extensions (in ArcGIS) and the plugins and .SVG symbol files that QGIS needs will also have to be installed and activated before the deployment team leaves for the operation.
- Once the team arrives at the operational area, time cannot be wasted on the installation of software, extensions or plugins.

The researcher, on the same computer system, performed the process of installation for both ArcGIS and QGIS. The installation process of both software products adhered to the abovementioned criteria. The installation of both ArcGIS and QGIS was easy to understand and very well documented (online support or help in this regard is also available), and therefore both software products were evaluated as being 'simple to install'.

Easy to update – updates are also easy to perform. When a user does not update his or her software, he or she misses out on new features and the software can become less trustworthy and secure.[34] In an operational scenario, all software updates will have to be done before the start of the operation – as far as possible. The update process in ArcGIS is fairly automated (the user follows the instructions in the license manager), unless the user wants to install the new version on a machine that is different from the one on which the previous version of ArcGIS 10.X was installed. In such a case, the previous product must first be de-authorised before authorising the new one. In QGIS, one can choose to uninstall the previous version and simply load the newest version. The user should take care to copy .SVG files when updates are being done on QGIS. Both these software products are therefore easy to update.

Intuitive – Wallen states, "software is only as good as its Graphical User Interface (GUI)."[35],[36] People will have issues with using the software if the GUI is poorly executed. Wallen mentions that a well-designed GUI can often overcome a "less-than-friendly underlying structure (or poor coding)",[37] but it still means that the software must be working as expected. In both these software products, the GUI is very well designed. With regard to the basic functionality, such as adding and displaying data, zooming, panning and working with the attribute table, the two software products look and feel fairly similar. Concerning the more advanced functionality, such as the spatial and 3D analysis functions, the functionality may be located in different tabs and buttons and even use different extensions and plugins. In QGIS, the Plugin Manager can be used to inspect available plugins and to get a description of each. In ArcGIS, the relevant tool is easily located when using the Search function. The GUI in both software products can be customised to fit the user's need. Furthermore, saving functions are

similar to the saving functions in other Microsoft software, which makes the GUIs more understandable to most people. Intuitiveness is a concept that is subjective in nature, and one that is influenced by the experience and knowledge of the GIS user. Based on Wallen's general description of intuitive, both these software products are evaluated as intuitive.[38] In terms of the specified use case, the only time the operation is affected by the GUI is when GIS operators are not familiar with the particular GUI. GIS operators must be fully trained on the particular software product, and in particular the GUI, in order to save time when completing a product for the operational commander.

Efficient – software should work as expected (be effective) and also be efficient. It must be able to work "seamlessly with underlying structures and subsystems".[39] Efficiency refers to the ability of the product to perform in the best manner with the least waste of time and effort. The efficiency and effectiveness of the software are also tied to 'intuitiveness'. In terms of the specified use case, no benchmark tests were done because of the many variables involved in efficiency; therefore, effectiveness was tested. Both ArcGIS and QGIS could produce all the required output products; both these software products were therefore evaluated as effective.

Pleasant, easy-to-navigate GUI – the GUI of the software must be both effective and intuitive. The primary function of the GUI should be to make the job easier for the end user. It does not help the end user if the design is trendy but makes for an unpleasant experience.[40] In both ArcGIS and QGIS, the design of the GUI is trendy, and definitely makes the job easier for the end user. In both cases, the design of the buttons already gives the user an idea of what they are used for and, if the cursor hovers over a button, the name of that button is shown. As mentioned earlier, the GUIs of both these software products are customisable. In ArcGIS, this can be done by using the Customize dialog box. The user can choose to hide certain toolbars or even create a custom toolbar or menu. In QGIS, the Customization dialog box can be found under the Settings tab. In both these software products, the GUI is divided into five main areas, namely Menu Bar, Tool Bar, Map Legend, Map View and Status Bar) (see Figures 13 and 14 below).
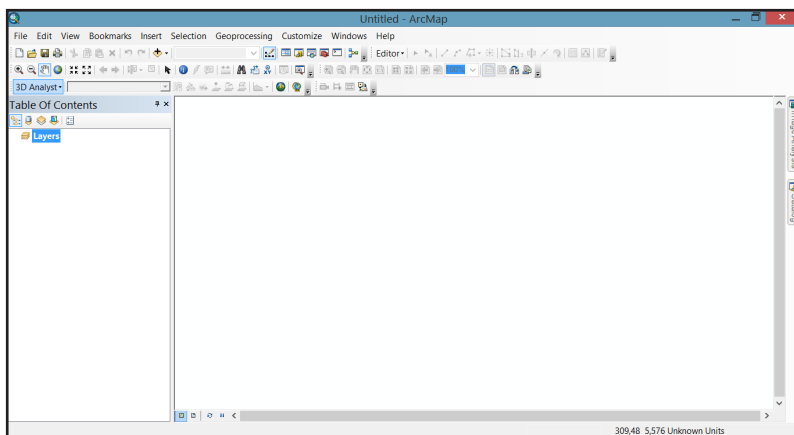

Figure 13: ArcMap GUI
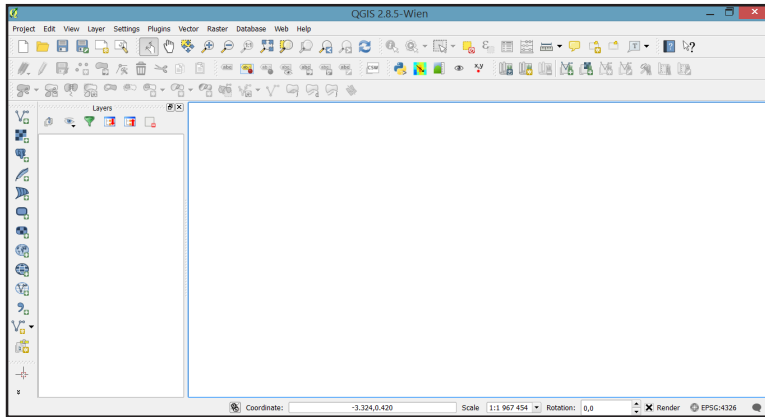
Figure 14: QGIS GUI

Easy to remove – the software removal process should be simple; otherwise, the software becomes a burden.[41] The uninstall process in both these software products is simple with no difficulties. In both cases an uninstall utility can be used to uninstall the software product. For both ArcGIS and QGIS, one can use the control panel, select Program and Features, navigate to the software product that needs to be uninstalled and choose to uninstall. A user can also inspect the program files on his or her computer, search for the software and delete it. As stated earlier, if the user plans to reuse .SVG symbols, he or she should remember to copy and save this folder before deleting QGIS. The uninstall process will not work differently given the specified use case. However, on SANDF computers, the installation and uninstalling of new software are done by a system administrator. The system administrator provides technical support and is the only person with the authority to alter the set-up of military computers, as is required by the security measures implemented in the SANDF.

Does not need third-party software – when a software product needs third-party software to keep it running, the computer can become exposed. This can generate a level of complication that average end users cannot handle.[42] ArcGIS 10.2 needs Microsoft .NET Framework 3.5 SP1 as a minimum requirement for installation.[43] This FOSS software product is, however, very easily obtainable, at no cost, on the Internet. QGIS does not need any third-party software to install and run.

Easy to troubleshoot – "No software is perfect".[44] If there is a software problem, it is imperative that the end user should be able to call support to have the issue resolved.[45] In terms of this criterion, the result may not be a simple 'yes' or 'no'. In terms of ArcGIS, troubleshooting certainly has a number of advantages. The user can access the Esri help files that are available to him or her, and if Internet access is available to the operation, the user can also access the Esri online support. Since the SANDF is paying the ArcGIS license fees, the operators will also be able to call Esri SA in such an event. If, however, the problem is coupled to a development issue in the software, the user might have to wait to see if it will be addressed when a newer version of the software is released. In terms of QGIS, the user manual can be downloaded before an operation to

assist with questions that might arise. If Internet access is available during the operation, GIS operators can also pose their question to the active QGIS support mailing list. The members of the mailing list are not required to answer any questions posted. In addition, if a bug in the software is reported, developers can decide whether to fix it or to develop additional functionality. As a result, the QGIS team encourages commercial support contracts with third parties. The QGIS website contains a list of such commercial support contractors with links to their respective websites. These companies offer QGIS product support and services to their clients.

Adheres to standards – standards are important in order to make interconnectivity between applications or hardware easy. Complications develop when developers do not adhere to standards. In such circumstances, end users will experience difficulty because their tools will not be able to communicate with other tools that do comply with the standards.[46] Both QGIS and ArcGIS supported the relevant standards needed to complete the tests in this use case (for example, standards for shapefiles, GeoTIFF files and supporting the feature model).

Effective error handling – the manner in which software handles a problem when it occurs is significant. The software must be able to warn the users and let them know what they can do to solve it. The software should not only 'time out' and close.[47] Considering the cholera use case and the tests that were run using both these software products, neither of them ever 'timed out' or 'closed'. In cases where the researcher did not complete a required field in a dialog box, the software guided the researcher to the problem area.

1. **Analyses of user-friendliness as compared between ArcGIS and QGIS**

Ten criteria were compared in order to determine the user-friendliness of both ArcGIS and QGIS. All 10 criteria were measured against the specified cholera use case. Some of the criteria were general in nature and not only true for this particular operation. Some of the criteria were also very closely related to one another. These were 'pleasant, easy-to-navigate GUI', 'intuitive' and 'efficient' as well as 'simple to install' and 'easy to remove'. However, in terms of the criteria 'does not need third-party software', ArcGIS does need third-party software for its installation and the like.

It was found that, although the GIS operator supporting an operation – such as the one specified in the use case – will definitely have to note some of the details mentioned in the paragraphs above (such as budgeting for commercial support for QGIS), both ArcGIS and QGIS can generally be considered to be user-friendly. The ArcGIS requirement for software, as stated above is also not considered to be a limiting factor in terms of the user-friendliness of the software, since this software is freely available to users.

2. **Testing costs**

The cost factor was one of the main reasons for conducting this research project. Cost factors are not compared in military operations in general, but only in using the SANDF as a use case to compare costs. QGIS is subject to the General Public License (GPL), and it is an open source GIS product that can be installed on as many workstations as needed in order to support the cholera operation, as specified in the use case. All plugins that will be needed to complete the products, as specified in the use case, can also be installed at no cost (except costs involved in obtaining Internet access).

In terms of costs for QGIS training, the SANDF developed an introductory course. For more advanced courses, the SANDF can attend courses at commercial contractors, such as Kartoza, as specified on the QGIS website. According to the course outcomes specified on the Kartoza website,[48] the five-day course, Advanced GIS with FOSS, will be suitable in order to complete the tasks as specified in the use case. There are also opportunities for free online courses such as the one being offered on the Canvas website.[49] Canvas is an open-source learning management system.

In terms of QGIS, the researcher suggests that military institutions should include the costs that are needed to obtain extra commercial support during their initial budgeting process for an operation in case this type of support is needed during the operation.

In terms of ArcGIS, the researcher acknowledges the fact that Esri SA currently has an end user license agreement (EULA) with the SANDF, which means that licenses for an operation such as the one mentioned in the use case will be supplied to the SANDF at a special discounted rate. The exact details and amounts regarding this agreement cannot be disclosed in this article, due to confidentiality clause in the client agreement.

In terms of existing training on ArcGIS, the researcher also acknowledges the fact that current GIS operators in the SANDF have, through the years, done quite a number of courses both in the SANDF itself and at Esri SA. The current knowledge base of present-day GIS operators in the SANDF with regard to ArcGIS is therefore quite extensive. New members are continuously joining this pool of GIS operators, which will require them to attend the same GIS training on the various GIS software. The SANDF itself offers the basic introductory course, and various free online courses are also being offered to ArcGIS users. In terms of the requirements for this use case, members will at least have to do courses at Esri SA up to the advanced level, performing analysis, designing maps with ArcGIS and working with rasters. In addition, members will have to do courses relating to the extensions Spatial analyst and 3D analyst. These courses provide operators with basic as well as advanced knowledge of the software, enabling them to perform basic tasks, map compositions and editing, as well as some more advanced spatial analysis functionalities and knowledge relating to the extensions that were used during this use case, namely Spatial analyst and 3D analyst.

3.   Analyses of costs as compared between ArcGIS and QGIS

In terms of the costs involved in acquiring software, as well as the costs for some of the training requirements, QGIS has a definite advantage over ArcGIS. In terms of the use case, the ArcGIS license and extensions needed, far exceeds the amount needed for QGIS. However, once the initial ArcGIS purchase is made, the support when troubleshooting occurs will be included in the EULA as part of the subscription fees.

4.   Discussion and conclusion

The results in the previous sections showed that QGIS can be used to produce outputs equivalent to those prepared with the baseline product, ArcGIS. In some cases, it was necessary to configure the QGIS output for an optimal viewing experience, but this is also the case for some of the ArcGIS outputs. Both products are easy to use, but require training and an understanding of the principles behind geographic information and mapping. More in-depth user studies may point out significant differences in the usability of the software, but that was not the goal of the current study. Proprietary

software vendors sometimes include exclusive technical support and training in the cost of the software licenses, regardless of whether this is used or not. With open source software, one is free to choose if and by whom technical support and training are provided. Furthermore, open source software can be installed on any number of desktops without going through a lengthy budgeting and procurement cycle. This is especially useful when GIS operations have to be expanded at short notice and when funds are limited.

Based on the results presented in this article, one can conclude that open source GIS software can be deployed successfully for military operations. This opens a world of alternative possibilities to the military. Institutions that would normally be deprived of GIS because of costs now have access to large selection tools. Open source geospatial technologies are available for requirements beyond those identified for the use case in this study, extending to field data collection, crowdsourcing, visualisation, spatial database management systems, and software stacks for web-based systems using client-server architectures.[50],[51],[52]

Nevertheless, adopting open source GIS should not be based solely on technical merit and the no-cost implication. Open source software products should be evaluated on a par with proprietary software in terms of their technical features, standard compatibility, reliability, ease of use, documentation, technical support, customisability and extensibility, costs of training, technical support and management requirements, such as budgeting and long-term maintainability.[53],[54],[55]

A limitation of this study was that the effectiveness of the GIS software to handle large data sets was not tested. The data sets used during this study were subsets of the study area. In the age of big geospatial data, the manner in which these GIS software products handle large volumes of data needs to be considered in many, if not most, use cases. This study compared two specific software products. The results might have been different if alternative open source and/or proprietary products had been used. Finally, this study did not assess the attitude of users towards FOSS. The results show that the technical functionality of open source is comparable to a proprietary solution but the question remains how users feel about using QGIS. This could be done in further work, as well as a user study to assess the usability (user interface) of the products.

Worldwide, the use of open source GIS is growing,[56] and it is likely that militaries will follow suit as staff are gaining knowledge and experience to the same levels they have in proprietary GIS products. Currently, the United Nations Open GIS Initiative[57] is leading the way by identifying and developing open source geospatial solutions that meet the requirements of United Nations operations. In the military geospatial solutions is a force multiplier which is described as the "capability that, when added to and employed by a combat force, significantly increases the combat potential of that force and thus enhances the probability of successful mission accomplishment".[58] Open source GIS has the potential to be a force multiplier in the military!

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ENDNOTES

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EFFECTS OF SELF DEFENCE TRAINING FOR SEXUAL ASSAULT PREVENTION IN THE AIR FORCE

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Abstract

Sexual assault in the military has become a prominent societal concern. A recently released Department of Defence report on military sexual abuse concluded that sexual abuse continues to be a significant problem in the armed forces. To address this issue, systematic and cultural change, including training military personnel on sexual assault and the prevention and protection against sexual abuse, is needed. A study examining the effectiveness of a week-long workshop using the Gracie Defense Systems was conducted. The results suggest that Gracie training designed to empower military personnel to prevent and protect themselves against sexual abuse and teach sexual awareness was effective. The overall effects of the training ($f2 = .41$; large ES) appear to affect underlying constructs such as self-efficacy, self-determination, vigilance and vulnerability. In addition, differences were found between males and females prior to training ($f2 = .44$) and after training ($f2 = .29$) as well as differences between those who had prior self-defence training and those that did not have such training ($f2 = .35$). Recommendations include field testing and validating a measure that adequately examines self-efficacy, self-determination, vigilance and vulnerability as well as continued efforts to implement sexual abuse training throughout the military and improve policies.

Findings from sexual assault training in the military

Over the past several decades, sexual assault (SA) has become an increasingly prominent societal concern for both men and women but in particular among women. The United Nations Commission on the Status of Women (UNCSW or CSW) characterises violence against women as a global problem with widespread and severe violation of the human rights of women, both in peacetime and in war.[1] Due to the complexity of the issue and the varying methods used to define and assess SA, it is difficult to measure the scope and magnitude of the problem accurately. Incidence and prevalence estimates for SA vary dramatically due to inconsistencies in methodologies and definitions. Elliott et al. define SA as any type of sexual behaviour that occurs without the clear consent from all parties.[2] Similarly, the Department of Justice (DoJ) defines SA in general terms. Sexual assault refers to any sexual activity, such as fondling, forcible sodomy, child molestation and/or rape.[3]

Using the DoJ definition of SA, studies indicate that between 3% and 25% of men and women in the general population experience some form of SA during the course of their lives. Similarly, Elliott et al.[4] examined SA among 941 participants and found that 22% of the women and 3,8% of the men reported had been sexually assaulted at least once in their lifetime. A study by Tjaden and Thoennes reported that 22,1% of women and 7,4% of men experienced SA at some point in their lives.[5] In sum, community samples of men yield prevalence rates ranging from 3% to 8% and 15% to 51% for women.[6,7,8,9,10]

Military sexual assault

Sexual assault in the military has become an obvious problem and concern for military personnel.[11],[12],[13] There are a plethora of studies that provide evidence of the intolerably high incidence of military sexual assault (MSA) against men and women.[14,15,16,17,18,19,20,21,22]

Similar to the DoJ definition of SA, the Department of Defence (DoD) defines MSA as "intentional sexual contact, characterized by use of force, physical threat or abuse of authority or when the victim does not or cannot consent".[23] The definition includes offences ranging from unwanted sexual contact to forcible sodomy and rape as well as attempts to commit these offences. Thus, MSA does not refer to one specific crime; rather, it encompasses a collection of sex crimes, including rape.[24],[25],[26]

Lipari et al. report an annual MSA prevalence rate of 6,8% for women and 1,8% for men among active-duty military personnel.[27] Among reservists, Street and colleagues found an annual MSA rate of 13,1% among females and 1,6% among males.[28] Lifetime prevalence rates of MSA are considerably higher. Among female veterans, Skinner et al. report a 23,0% lifetime prevalence rate.[29] Sadler et al. report a 28% lifetime prevalence rate.[30] Campbell et al. report a 22% lifetime prevalence rate.[31] Kimerling et al. report a 21,5% lifetime prevalence rate.[32] Compared to civilians, the rate of reported SA is three times higher for military women than for civilian women.[33] In sum, these studies document a substantial prevalence rate of MSA among women and men, with women consistently reporting a considerably higher rate.

Additionally, there is evidence to suggest that these rates are considerably underreported due to both real and perceived consequences of reporting the experience.[34],[35],[36] More than 86% of service members do not report their assault, less than 5% of all SA cases are put forward for prosecution, and less than a third of those cases result in imprisonment.[37],[38],[39],[40] The RAND Military Workplace Study identified various forms of retaliation that military personnel might experience if they report MSA, such as social retaliation, professional retaliation, administrative action, and punishment.[41]

Factors associated with women's risk of MSA have been examined. Sadler et al. found that environmental factors associated with an increased likelihood of rape in the military included being sexually harassed by an officer and receiving unwanted sexual advances while on duty or while in sleeping quarters.[42] The study also reported that the

assailant was likely to be under the influence of alcohol and/or drugs at the time of the offence.[43] Women who reported a hostile work environment were six times more likely to experience rape. Women who reported that they had experienced unwanted sexual advances in their sleeping quarters were three times more likely to experience rape.[44]

A study was conducted to examine current perceptions of the sexual harassment and assault problem in today's United States (US) military.[45] The views of 120 military service members were collected via interviews and compared to those of civilians. On average, soldiers believed that sexual harassment and SA would occur while on duty, blaming the victim and treating them accordingly.[46] Fortunately, they also reported that both sexual harassment and SA should not be tolerated, and that the measures in place to address these problems in the military are inadequate.[47] The White House raised the profile of this serious public health issue with a report on violence against women in the military released in 2014.[48] Indeed, the military culture, where colleagues are comrades-in-arms, affects both the reporting of incidents of sexual assault and the perceptions held regarding the severity of SA incidents.

Effects of sexual assault in the military

The consequences of SA are significant, complex and often of long duration. Universal consequences include a wide range of physical and mental health problems such as depression, post-traumatic stress disorder (PTSD), chronic pain, diabetes, anxiety and eating disorders.[49],[50] The effects of SA in the military include these problems, which are amplified and exacerbated by the unique characteristics of military culture. Military culture is dominated by formality, hierarchical structures, paternalistic beliefs, the importance of leadership, intolerance for mistakes, dependability and camaraderie, and emotional control.[51],[52] If a member of the military calls into question the culture, the group acts quickly to diminish the individual in support of the larger group and the group attempts to preserve the status quo. Given the needs of the military to emphasise collective responsibility and strength in the unit (at the very least for defensive and offensive strategic purposes), individuality and personal control are non-existent.[53],[54]

In line with this reasoning, Northcut and Kienow propose a trauma trifecta that distinctively operates in the military.[55] The factors included in the trifecta are the loss of personal and/or professional identity, the regulatory functions of self-harming behaviours, and the re-traumatisation service members experience as a result of the specific military culture and its services to veterans.[56] The uniqueness of the military trauma trifecta can best be understood in a social context. As discussed, the military is a highly organised, hierarchical culture that includes the loss of personal identity. The military culture exists to support the whole so that when one part of the whole appears under attack, others close rank to support the existing structures. The second part is found where a member of the military engages in some form of self-damage. This may involve cutting, self-starvation or some other means of inflicting harm on self.[57] Because of the military's emphasis on physical readiness, this maladaptive means of coping with anger or seeking to regain emotional control is more concerning and perhaps more disabling than it would be for a civilian. The third part of the trifecta

deals with a military member being re-traumatised from the military environment itself. Certain individuals, questioning practices, internal messages, or other actions may trigger reminders of the SA.[58],[59]

Military sexual assault policy

In the 1990s, significant civilian legal reforms were enacted in Country to address SA for both men and women.[60] Initially, the reforms required colleges to disclose crime statistics and prevention activities to the public. The military followed suit, making revisions to its SA policies. Despite these changes, important issues associated with SA in the military went largely unattended until the commencement of the 2000 Air Force Inspector General (AFIG) investigation. This investigation precipitated the establishment of the DoD Sexual Assault Prevention and Response Office (SAPRO) whose purpose it is to investigate and respond to MSA claims.[61] Next, in 2011 the Defence Sexual Trauma Response and Good Governance (STRONG) Act was passed.[62] Many of these provisions of the bill were included in the National Defence Authorisation Act (NDAA) and have become law.[63] Provisions included that Military Protective Orders (MPOs) had to be made standing orders and that civilian authorities had to be notified when an MPO was issued and affected off-base personnel. Military personnel who had experienced MSA had a right to base transfer and counsel, and advocates were to be trained to assist victims.

In addition, the NDAA contained changes in federal law aimed specifically at the prevention of MSA.[64] Three prominent features of the legislation were designed to ramp up enforcement. Article 60 of the NDAA eliminated the commander's ability to modify sentences for serious offences, overturn guilty verdicts, or reduce findings to a lesser sentence. Article 32 eliminated the necessity for those who had experienced MSA to testify in a trial. Third, there were increased procedural requirements for commanders to follow when adjudicating SA cases, resulting in greater professional accountability.[65]

Despite these efforts to reduce MSA, as well as the "Zero Tolerance" concept, a DoD report in 2014 concluded that MSA continued to be a significant problem in the Armed Forces in Country.[66] The rate of continued occurrences in Country remains unacceptably high. Both the increase in frequency of SA and continued low levels of reporting their occurrence to authorities are ongoing causes for concern.

Sexual assault prevention training

Studies on SA training support the positive psychological effects of teaching physical and protective strategies, such as martial arts self-defence training among non-military populations. For example, Weitlauf et al. studied 80 undergraduate women who completed a 12-hour self-defence training programme.[67] Pre- and post-test follow-up measures were administered to assess change as a result of participant involvement in this training. The results of the study by Weitlauf et al. revealed an increase in physical and global efficacy beliefs beyond the task-specific demands of the training. The participants reported an enhanced feeling of assertiveness after completion of training, and an improved sense of well-being.[68]

Martial arts self-defence training not only attempts to increase participants' ability to physically protect themselves but it also attempts to increase or decrease psychological factors such as self-efficacy, self-determination, vigilance and vulnerability.[69],[70],[71],[72],[73] These psychological factors were defined within a military context. Self-efficacy is defined as the extent to which a military member believes he or she is effective in performing his or her duties. Self-determination relates to a member's willpower and resolve.[74] Vigilance is the capacity to be proactive and attentive in evaluating environmental cues and intentions of others, while vulnerability is experiencing higher-end risk for SA and harm.[75]

In 2012, the Country Air Force introduced the Gracie Defense Systems (GDS) training. The training is tailored to meet the unique needs of the military. It is comprehensive and includes strategies such as pre-emptive boundary setting, self-defence techniques, and jiu-jitsu training.[76] The attitudes and skills acquired through the training are believed to empower military personnel by means of increasing their self-efficacy, self-determination and vigilance, and decreasing their vulnerability.[77] Unfortunately, there is a dearth of empirical evidence supporting the effectiveness of GDS training in the military.[78],[79],[80] Research validating this unique approach to preventing and protecting military members against SA is needed.

The present study examined the effectiveness of GDS training on military personnel at a base in the Midwest. The study was organised around four research hypotheses:

H_1 – There will be a significant increase in participants' sexual assault awareness and empowerment after the completion of GDS training (one-tailed test).

H_2 – There will be a significant difference between male and female participants' responses to the GDS training (two-tailed test).

H_3 – There will be a significant difference between participants who had prior self-defence training and those with no prior self-defence training in terms of their level of sexual assault awareness and empowerment (two-tailed test).

H_4 – There will be a significant difference between participants who had prior SA training and those with no prior SA training in terms of their level of sexual assault awareness and empowerment (two-tailed test).

Method

Participants

The GDS training and recruiting of military personnel was announced and posted by Air Force command at a major base in the United States. The training was made available to all male and female Air Force base personnel. Participants enrolled on a first-come, first-serve basis, with a maximum of 100 participants. The solicitation yielded 75 participants. Of the programme participants, 58 were male and 17 female. The majority (77%) was Caucasian and most were in the age range of 25–32 (42,6%). See Table 1 for details on the demographic make-up of the sample.

Measure

In order to create a survey that could measure the effectiveness of the GDS training, a thorough review of the literature was completed.[81],[82],[83],[84] Items that appeared to measure SA awareness and empowerment and the underlying constructs of interest in this study (i.e. self-efficacy, self-determination, vigilance and vulnerability) were selected, modified and evaluated by a team of researchers. The result was a 42-item survey that used a six-point Likert-type scale with 1 being 'strongly agree' and 6 being 'strongly disagree'. The survey was reviewed and approved by the University's Human Subjects Review office as well as JAG officers at the Air Force Base.

Procedures

After the volunteers had been recruited and after they had agreed to participate, they were notified of the dates and times of the training. Upon arriving on the first day of training, a graduate research assistant (RA) asked all participants to complete the 42-item survey. Immediately following the training, the RA administered the same survey. All data was coded in a manner that ensured responses were anonymous.

Data analysis

A one-tailed paired *t*-test was chosen to examine the first hypothesis. Independent one-tailed and two-tailed *t*-tests were chosen to examine the second, third and fourth hypotheses. All analyses were conducted in SPSS Version 17. There were no missing data.

Results

In order to examine the overall effects of the GDS training, a total score was calculated by summing the items. A low score reflected more sexual assault awareness and empowerment. The paired one-tailed *t*-test was statistically significant with an almost 10-point mean decrease in total score (pre-mean 123.9 and post-mean 114; *f*2 = .41) indicating positive changes. The independent two-tailed *t*-test used to investigate gender differences on pre-total and post-total scores was statistically significant with males changing by 8 points (*f*2 = .25) and females by 14 points (*f*2 = .44). These differences are presented in Table 2. Interestingly, the male pre-training baseline of 120 was equal to the female post-training baseline. Thus, the females ended with the same mean score as that with which the males began. Nonetheless, the data strongly suggested that the training yielded improvements for both males and females.

An independent two-tailed *t*-test compared the differences on pre- and post-total scores between those with prior self-defence training and those with no prior self-defence training. Significant differences were found between the two groups on their pre-training total score (*f*2 = .29; small effect) but not on their post-training score. Those with prior self-defence training had a mean of 121 and those with no defence training had a mean of 128. These differences disappeared following the training with both groups having almost identical final scores. It appeared as though an "equalisation" process occurred where participants tended to have similar scores following the training.

Finally, an independent two-tailed *t*-test compared the differences on pre- and post-total scores between those with prior SA training and those with no prior self-defence training. No differences were found. Table 3 presents the mean differences between these two groups while Table 4 illustrates the distributions for these questions, with almost half (42,6%) of the sample having both SA and self-defence training before attending the GDS training and 11% not having any training.

Discussion

The study reported here examined the effectiveness of a martial arts ju-jitsu self-defence programme designed to empower military personnel in the Country Air Force in preventing and defending themselves against sexual assault (SA). Consistent with the hypotheses, the present research found that Gracie training was effective. Specifically, both males and females benefited from being involved. The overall positive effects of the GDS training programme appear to have influenced psychological factors, namely self-efficacy, self-determination, vigilance and vulnerability. Further results suggest that gender and prior self-defence influenced a participant's response. Women demonstrated a considerably greater gain when compared to men. The male pre-training baseline mean was 120, a number precisely equivalent to the female post-training mean score. This demonstrates that women, on average, scored at the same level after the training as men scored before the training. This disparity between males and females aligns with a model where those less prepared to defend themselves against SA (women) indeed are more commonly victimised by the act. As such, the present study further reinforced the importance of increasing opportunities for women in the military to gain training that will empower them in their ability to circumvent and protect themselves against SA.

Although participants with prior self-defence training had a statistically significant lower mean at baseline (121) when compared to those with no training (128), the post-total means were almost identical. Thus, those with prior self-defence training did not experience the same gains as those without training. Although this form of prior military self-defence training is unknown, these results indicate that any form of military self-defence training has lasting effects. Moreover, prior self-defence training may have had the unintended effect of slowing the acquisition or use of new skills. It could be hypothesised that those with prior self-defence training may naturally approach the GDS training within the frame of 'I already know this', and therefore contribute to a decreased acquisition of training skills.

The ratio of male and female participants mirrors almost identically the gender distribution of males and females in this US military branch. Participants volunteered in direct relationship to their gender distribution in the military ranks. It might have been anticipated that, due to the special investigation committees in recent years, the visibility given to the problem by the media, importance shown by base command, and genuine interest in the topic on the part of women themselves, women would have registered for GDS training in higher than proportionate numbers. They did not. This statistic was important and suggested that volunteering and SA prevention training registration patterns warrant further investigation.

Future directions

Although this was more exploratory than conclusive, it is clear that GDS training is effective. As a result, four main recommendations are put forth:

- the GDS survey should be field tested and validated;
- recruitment strategies that target women need to be created;
- a 'train the trainer' model should be develop; and
- there should be continual focus on improving SA policy in the military.

The questions included in the 42-item survey were selected after a thorough review of the literature and examination of the GDS curriculum. The total score of the survey is believed to measure overall empowerment and SA awareness, and includes four underlying constructs: self-efficacy, self-determination, vigilance and vulnerability. The importance of validating the survey is underscored by the positive results and the potential of having GDS training administered across the military. More studies need to be conducted in this area in order to further explain the relationship between martial arts training and underlying psychological factors, namely self-efficacy, self-determination, vigilance and vulnerability.

Given the intolerably high rates of women in the Country military experiencing SA and based on the empirical evidence in the present study, which demonstrated the significant gains experienced by women, it is recommended that future GDS trainings implement intentional recruitment methods to increase the number of female participants. Since the number of females who volunteered to become trainers was proportionate to the number of females in the military service, it is strongly recommended that additional measures be taken to attract more women to future trainings.

The development of a 'train the trainer' model where participants learn the techniques and teaching methodologies necessary to train other members of the military has the potential to be very fruitful. This type of model was recently successfully implemented at an air force base in Wyoming in 2014.[85] Over 80 military personnel completed an instructor certification course, which taught everything from preventing SA to physical self-defence techniques. It is extremely important to have well-qualified trainers instructing due to the sensitive nature of the content.

Finally, the under-reporting of MSA occurrence warrants strident response from the military and policymakers. To move policy reform forward with the understanding that MSA renders great harm to individuals, families and communities, implores practitioners, policymakers, and researchers to collaborate and identify the information and elements that are currently missing from American military policy.

Limitations

A major limitation of this study was the lack of a validated survey. It is believed that the 42-item measure yielded information on empowerment and sexual assault awareness

and four underlying psychological factors. However, larger samples are required and validation studies need to be completed before this can be concluded. Another limitation of this study was the lack of control over participant recruiting. Researchers were not consulted by the military base on how to recruit GDS participants. As such, the researchers were not able to establish protocols with regard to the ratio of male and female participants, prior SA or self-defence training, and a comparison group. Future application and study of GDS should incorporate more intentional participant recruiting methods.

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DEVELOPING MILITARY ENVIRONMENTAL LITERACY IN THE SOUTH AFRICAN ARMY THROUGH A DEDICATED MILITARY ENVIRONMENTAL MANAGEMENT COURSE

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Abstract

It is important for soldiers to be military environmentally literate to prevent unacceptable behaviour in the environment in which they conduct their missions. This is especially true during peacekeeping and disaster relief missions, but holds equally true for combat situations. Military environmental literacy refers to the nature and level of the attitude toward, knowledge about, and behaviour in and toward the environment in which the military operates. The construct of military environmental literacy consists of three components: military environmental attitude (a general feeling of favour or disfavour toward the military environment, i.e. the environment in which the military operates); military environmental knowledge (the ability to identify a number of concepts and behaviour patterns related to the military environment, i.e. the environment in which the military operates); and military environmental behaviour (a demonstration of how one acts toward or in the military environment in which the military operates). The MEL of South African soldiers was measured in a study reported on in 2017, as well as in a test–retest survey in 2018. A specially developed valid and reliable questionnaire to test military environmental literacy was used in both surveys. The study reported on here, argued that exposing soldiers to a dedicated military environmental management course could influence their military environmental literacy positively.

Keywords: military environmental course, military environmental literacy, environmental attitude, environmental knowledge, environmental behaviour

A case for military environmentally literate soldiers

In their book on United States (US) Army environmental considerations for operations, Mosher et al. ask the crucial question, "[w]hy should commanders care about environmental issues?"[1] Concerns such as soldiers' health and safety, mission success, the amplification of environmental issues during long deployments, and the importance of 'doing the right thing' are offered as reasons for taking environmental matters into consideration during all phases of military activity.

Modern-day defence forces are progressively subjected to raised environmental concerns, evidenced by mounting corpuses of national and international environmental legislation that regulates all military activities. There is growing recognition of the environmental dimension of global security, and militaries worldwide are coming under increasing pressure to perform their activities in an environmentally responsible manner and to abide by national and international environmental legislation, both in times of war and during peacetime.[2]

The effects of military activity on the environment tend to be variegated. Mosher et al. explain that the long duration of occupations and post-conflict involvements of the US military placed emphasis on the importance of environmental considerations in military conduct. They advance the following reason: in conflict zones where the environment poses a threat to soldiers, longer stays exacerbate the threat.[3] Bonds concur, and reports that, during the Iraq and Afghanistan wars open-air burn pits used to dispose of solid waste caused health problems for US soldiers and Iraqi and Afghan civilians alike. He also noted that it was an environmentally literate soldier with a PhD in Environmental Engineering who first alerted leadership to the problems associated with the US Army's mode of waste management.[4]

The actions of US soldiers with respect to the local environment had become increasingly important because of the lasting consequences of such actions on the local population, while improvement of the local environment could have generated goodwill among the local population toward the US occupying forces.

It is important to note that poorly handled environmental impacts are not bound by borders and can easily cloud good relations with countries bordering the conflict zone. In 2012, when American soldiers inadvertently burnt copies of the Koran in Muslim Afghanistan, the US military suffered severe reprisals, protests, and deaths among soldiers. They learnt the hard way that the total local environment, including the cultural environment, should be respected at all times.[5] More importantly, the event tarnished the image of Americans among both the Afghan population and the neighbouring Muslim nations, negatively influencing the reaching of American military objectives in that conflict.

To modern militaries, also in the South African (SA) context, environmental concerns are significant at all levels of military planning and execution. To deal with the increasing complexity of environmental concerns in a mission-diverse military environment, military environmentally literate soldiers are needed.

But what is military environmental literacy (MEL), and how can it be tested? More importantly, what can be done to develop the MEL of soldiers; hence, avoiding the negative effects attributed to environmentally illiterate soldiers discussed above? This article wants to elucidate these questions by presenting research results from a study reported on in 2017 and a follow-up survey done in 2018. Both sets of results indicate a positive relationship between MEL and the completion of a dedicated military environmental course offered annually to members of the South African Department of Defence (DoD).

Environmental literacy and the military

Despite the lack of a precise definition of environmental literacy (EL), a widely accepted working definition provided by Roth[6] has been adopted by most researchers in the field.[7] Roth defines EL as an individual's knowledge about and attitude toward the environment and environmental issues, skills and motivation possessed in working toward the resolution of environmental problems, and active involvement in working toward the maintenance of dynamic equilibrium between the quality of life and the quality of the environment.[8]

According to Esterhuyse a specific military culture, ethos and professional conduct have become established in the military.[9] The military culture differs significantly from civilian conduct and practice, and poses unique problems, offers opportunities and requires specific skills in managing the environment in the military. Consequently, the military environment requires a unique definition to encompass MEL effectively. Godschalk distinguishes between military-integrated environmental management applied by the DoD and integrated environmental management adopted and applied by civilian enterprises.[10] Appropriately, the term 'military environmental literacy' distinguishes between military-specific environmental literacy and its civilian counterpart.

For the purposes of the research reported here, MEL was defined as the nature and level of the attitude toward, knowledge about, and behaviour in and toward the environment within which the military operates. From this definition, it is clear that MEL comprises three components, namely attitude towards military environmental issues, knowledge about the military environment, and behaviour in the military environment.

Environmental attitude can be defined as "a psychological tendency expressed by evaluating the natural environment with some degree of favour or disfavour".[11] The operational definition of **military environmental attitude (MEA)** is that it is *a general feeling of favour or disfavour toward the military environment, i.e. the environment within which the military operates*.[12]

Chao describes environmental behaviour (EB) as to "act toward the environment",[13] while Kollmuss and Agyeman refine matters by defining pro-environmental behaviour as "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world".[14] Bamberg and Möser expand and describe pro-environmental behaviour as –

[A] mixture of self-interest (e.g. to pursue a strategy that minimises one's own health risk) and of concern for other people, the next generation, other species, or whole ecosystems (e.g. preventing air pollution that may cause risks for others' health and/or the global climate).[15]

Military environmental behaviour (MEB) was therefore defined in the current study as a *demonstration of how one acts toward or in the military environment in which the military operates*.[16]

A further distinction is drawn between self-reported and observed behaviour and the implications for interpreting results from the two types of behaviour measurement. Gifford and Nilsson highlight the fact that the vast majority of EB studies address self-reported and not observed behaviour.[17] Self-reporting of EB is relatively undemanding and inexpensive, and it can accommodate the diverse components of behaviour, such as energy-saving measures and respect for the cultural and religious environment, something not always possible with observed behaviour, especially in the military. Jenner et al., Chen, Pahilan and Orlander as well as Dobbinson et al. have all compared the results of self-reported and observed behaviour and found that self-reported behaviour usually overstates observed behaviour.[18] Huffman et al. found a weak correlation between observed and reported behaviour,[19] while Dobbinson et al. reported similar trends over time when comparing self-reported and observed behaviour of the same phenomenon.[20] The MEL surveys (2017 and 2018) measured self-reported and not observed EB, the reasons being ease of measurement, time economy, cost-effectiveness and ability to capture diverse behaviours associated with military actions. Since most research focuses on self-reported EB, comparison of results with a large corpus of research is possible. An important caveat is that, according to the literature quoted above, self-reported behaviour overstates actual behaviour.

Dodd et al. distinguish between "objective or actual knowledge (what a person actually knows about a product, issue or object) and subjective or perceived knowledge (what a person thinks he/she knows)."[21] In the current research, objective or actual knowledge was assessed through the military environmental questionnaire. **Military environmental knowledge (MEK)** was consequently defined as *the ability to identify several concepts and behaviour patterns related to the military environment, i.e. the environment in which the military operates*.[22]

The construct of MEL thus constitutes the combination of affective, behavioural and cognitive components (MEA, MEB and MEK) and will be used as such in this article.

The military environmental literacy questionnaire and survey

Smit developed a valid and reliable questionnaire to test MEL in the SA Army.[23] The production of the final questionnaire was a procedure that commenced with a literature search and review, and continued with initial questionnaire development, focus group input, panel evaluation, pretesting, piloting and statistical analysis, and final item selection. During each of these steps, the utmost care was taken to ensure the academic and statistical integrity of the process. Eventually, the exercise rendered a ten-page, organisation-specific, valid and reliable questionnaire for testing MEL in an SA Army context (see Table 1).

The final questionnaire was accompanied by a letter of introduction. The main body of the questionnaire consisted of five sections and a consent form. The letter of introduction sketches the nature and purpose of the research, deals with confidentiality issues, explains the purpose of the consent form and requests the participants to take part in the research by completing the items in the questionnaire.

Table 1: The structure and content of the final military environmental literacy questionnaire (Adapted from Smit, 2017)[24]

STRUCTURAL ELEMENT		CONTENT
Letter of introduction		Explanatory information for the participants to enable them to make an informed decision about participation in the survey
Quantitative	Attitude scale	Eliciting responses regarding attitude 15 Likert-type items
	Behaviour scale	Eliciting responses regarding self-reported behaviour 13 Likert-type items
	Knowledge scale	Eliciting responses to military environmental knowledge items 14 multiple-choice items
Qualitative	Open-ended items	Allow to motivate their responses and establish an environmental narrative Six open-ended items *(first, two items, which correspond to the attitude section in the quantitative part of the questionnaire; then two, which correspond to the behaviour section; and finally, two, which correspond to the knowledge section)*
Biographical and service history section		Eliciting biographical and service history information 16 open-ended items
Informed consent form		Explanation of the implications of participation in the research Signature required from a participant to respond

The attitude section of the main questionnaire investigates the attitude of participants toward the environment in which the military operates. The main aim of this scale is to elicit responses from participants regarding their attitude toward the military environment and military environmental issues. The **attitude** section consists of 15 items, which examine attitude toward environmental concerns, such as:

- protection of the environment;
- the cultural environment;
- planning of operations;
- protection of wildlife;
- waste production;
- environmental management plans;
- environmental laws;
- pollution;
- recycling;
- soil erosion;
- damage to the environment;
- the rights of local inhabitants; and
- the environmental image of the SA Army.

The **behaviour** section investigates the self-reported behaviour of the participants. The main aim of this scale is to elicit responses regarding participants' behaviour in the military environment while executing their task. The scale comprises 13 items dealing with themes such as:

- the procedure followed after an oil spill;
- energy conservation;
- littering;
- regulations regarding the environment;
- respect for the cultural environment;
- destruction of the natural environment;
- recycling;
- conduct when selecting alternative transportation routes; and
- respect for the traditions and customs of local populations.

In the **knowledge** section, participants address a series of multiple-choice items. The aim of this scale is to test the knowledge and awareness of participants regarding environmental concerns with which they are confronted at their workplace. This scale consists of 14 items and engages with themes, such as:

- international conventions;
- important military environmental acronyms;
- environmental rights;
- environmental laws;
- procedures for storing hazardous materials;
- handling refuse;
- storing fuel;
- disposing of batteries;
- recycling of wastes;
- troop movements;
- cultural issues among local populations;
- conduct during shooting exercises; and
- the handling of unexploded ammunition.

A section with open-ended items is included in the questionnaire to afford participants the opportunity to motivate their answers and to establish a military environmental narrative that supplies qualitative data to complement the quantitative data of the rest of the questionnaire; thus, enabling triangulation. The items in this fourth section investigate themes, such as:

- the importance of environmental protection;
- the level of environmental awareness of participants;
- whether good environmental practices can improve mission success;
- conduct at work;
- the environmental education and training the participant received from the SA Army; and
- the need for further information about the environment in which the military operates.

The biographical and service history section elicits responses to 16 personal items.

The form used to secure consent for participation in the survey accompanies the final questionnaire as a separate sheet. The consent form spells out the purpose of the survey, procedures and potential risks and discomforts, potential benefits and rewards (if any) for participants, the terms of confidentiality, participation and withdrawal, identification of the researcher and the research assistant(s), and the rights of research subjects. All participants are required to sign the form, with the supervisor (researcher or research assistant) co-signing.

This questionnaire was used to survey 25 units spread throughout South Africa that were proportionally representative of the formations of the SA Army. At the time of the survey, the SA Army had 34 463 members. A total of 1 090 questionnaires were analysed for this survey, representing a sample proportion of 3,2% of all personnel and a 90,6% response rate. The final results of this study were reported on in 2017.[25]

The annual military environmental management course

Soldiers in the SA Army regularly receive military environmental management (MEM) education and training as part of their general training. Soldiers with a specific interest in MEM can apply to enrol for an annual, comprehensive, five-week-long MEM course. This course is presented by senior environmental managers from the DoD with vast experience in both the theoretical as well as practical aspects of MEM. The course consists of seven modules dealing with such diverse topics as –

- sustainability;
- environmental management in the DoD;
- environmental law and policy;
- integrated environmental management;
- staff work and planning;
- occupational health and safety; and
- communication skills.[26]

The assumption is that, having completed such a military-specific environmental course, the MEL of the graduates would have been positively affected. This assumption is corroborated by research done by Smit, Karatekin as well as Sarıkaya and Saraç.[27]

In 2018, the MEL questionnaire was used to survey the soldiers attending the course, prior to the course and again on completion of the course according to the test–retest method.[28] Fourteen participants took part in this survey. This constitute a response rate of 87,5% of the total population.

Survey logistics and ethical considerations

In both the surveys, carefully selected and trained research assistants distributed and collected the questionnaires. Potential participants were informed, both verbally and in writing, that participation is entirely voluntary and that non-participation would not disadvantage them in any way. During the 2018 test–retest survey, participants were asked to complete the questionnaire prior to the start of the course. They were not informed that they would be asked to complete the questionnaire on completion of the course again. At the end of the course, participants were asked to complete the survey again. In both cases, all participants had to complete an informed consent form before completing the questionnaire.

Obtaining ethical clearance is an essential element of survey research that involves the invasion of participants' privacy, and so ethical considerations are crucially important.[29] Permission and ethical clearance for both surveys as part of a wider study were sought and granted by the Chief of the South African Army, as well as by the Research Ethics Committee of Stellenbosch University.

The influence of the MEM course in developing the MEL of SA Army soldiers

Researchers such as Özden (2008), Xiao, Dunlap and Hong (2013), and Conroy and Emerson (2014) postulate that education is a useful indicator of environmental literacy with increased levels of education indicative of positive environmental attitudes, behaviour and knowledge.[30] Surprisingly enough, this was not the case in the survey conducted by Smit.[31] In the research by Smit, both the results for general education level and geography education rendered inconclusive results. The explanation put forth by Smit and Van der Merwe is that, because MEL is such a focused, military-specific construct, and because the MEL questionnaire measured this construct, the results were expected.[32] In summary, MEL is a military-specific construct where general education does not render the same results as civilian EL.

The results for the annual MEM course, a course focused on military personnel and the military environment, produced different results. These results were investigated and are discussed in the remainder of this article. MEA results from the survey reported on in 2017 and for the 2018 test–retest are discussed first, followed by the MEK and MEB results. The article will conclude with the MEL results for both surveys and the implications for MEM.

Military environmental attitude (MEA) in the SA Army

Following the general practice in environmental attitude studies, an overall indicator of environmental attitude, the arithmetic averages of Likert-code values for the 15 items

recorded in Section A of the questionnaire were calculated.[33] Histograms were used to illustrate the results graphically as recommended by McKillup.[34] It is important to note the agreement level being indicated toward the lower end of the scale (ideally 1) and disagreement by the higher values (5 maximum). The lower values indicate an increasingly strong positive attitude toward the environment and the environmental issues raised about the domains in which the military operates.

MEA according to the environmental course determinant (2017 results)

Figure 1 contrasts the attitude of participants who had completed an environmental course with the attitude of those who had not. The *F*-test assessed the hypothesis that the attitudes are similar, regardless of whether participants had completed environmental courses or not. The *F*-statistic ($F_{1, 1085} = 8.9$, $p < 0.01$) indicates that this was not the case, and the hypothesis could be rejected.[35]
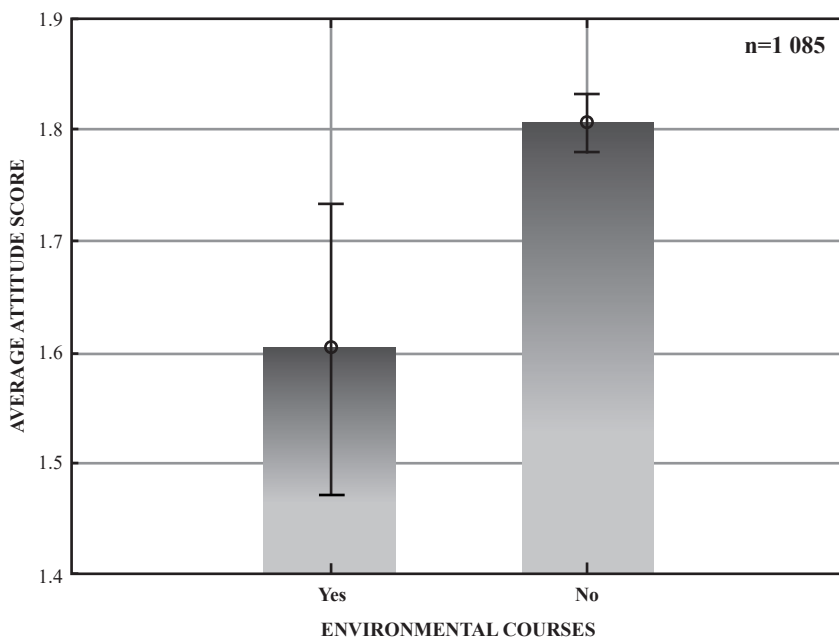
Figure 1: Average attitude score on completion of environmental courses

(Adapted from Smit, 2017)[36]

A mean attitude score of 1.6 for participants who had completed an environmental course and a mean score of 1.8 for those who had not, underscored the statistically significant difference that exists, namely participants who had completed an environmental course have a better environmental attitude than those who had not. This is noteworthy because it confirms that military environmental courses do improve

the attitude of members and that DoD management could further improve the MEA of soldiers through the existing programme. Given that less than 4% of participants had attended an environmental course, the result is exceptional and points to an urgent need to enhance access to these courses.

MEA according to the environmental course determinant (2018 results)

In the test–retest survey of 2018, the MEA results for both the survey conducted prior to the course and after the course, registered a result of 1.5. This indicates that there was no difference in the MEA of participants prior to taking the course and after completing the course. Although this does not correspond to the 2017 results, what is important here is that a result of 1.5 is an extremely positive result, far better than any result in the 2017 survey. This indicates a group with an already very favourable attitude towards military environmental issues. To improve their attitude further will be extremely difficult, and not really necessary. This point can be elaborated further by analysing the research of Lang who found that incoming college students at Bloomsburg University of Pennsylvania chose majors that were consistent with their world-views.[37] This implies that people who choose to engage with environmental education, already have a favourable attitude towards environmental issues. In this regard, it is important to remember that the soldiers choose to attend this environmental course and are not nominated to do so.

Military environmental knowledge (MEK) in the SA Army

The knowledge component of EL reflects the cognitive strand of EL.[38] In the context of MEL, MEK refers to the ability to identify correctly environmental and management concepts and expected behaviour related to the military environment. Researchers employ two approaches to investigate environmental knowledge, namely subjective and objective knowledge.[39] Subjective knowledge is a participant's own estimation of knowledge about an issue − also known as 'perceived knowledge'. Objective or actual knowledge relates to real, measurable knowledge about an issue.[40] Regarding environmental knowledge, an 'issue' is some kind of environmental matter. The present survey tested objective knowledge levels to ascertain what participants really knew as opposed to what they thought they knew.

Studies of objective environmental knowledge performance conducted among various groups of adults in different countries have produced knowledge scores as low as 36% and as high as 83% (see Table 2). Generally, the higher knowledge scores are attained in developed countries, but there are exceptions. Educated target populations scored highest with an average of 60,2% for all the studies plotted in Table 2. From results, it appears that Malaysia is the most environmentally knowledgeable nation. The knowledge scores of soldiers were interpreted in the light of these results.

Interpreting these results, researchers used different scoring matrices to indicate qualitatively what constitutes good, average or bad environmental knowledge scores.[41] Ehrampoush and Moghadam considered scores of ≤ 50% as 'bad', 50–84% as 'moderate' and > 85% as 'good'.[42] Kaplowitz and Levine employed the American

National Environmental Education and Training Foundation (NEETF) score norm of ≥ 70% as 'adequate' environmental knowledge and all else as 'inadequate'[43],[44]. To Karatekin, ≤ 40% is 'bad', 41–70% is medium and ≥ 70% is 'good' environmental knowledge.[45] Rating the applicability of these knowledge scales is not easy but it is noteworthy that Coyle describes the NEETF questionnaire as testing only "basic environmental knowledge".[46] This may explain NEETF's high 70% cut-off level for 'adequate' environmental knowledge, with participants failing the test if they score below this point. If the NEETF grading system were applied for all the studies reported in Table 2, only four universities, one group of schoolchildren and one group of adult participants would have passed the knowledge test.

Table 2: Average environmental knowledge scores from international studies

(Adapted from Smit, 2017)[47]

KNOWLEDGE SCORE	GROUP	COUNTRY	SOURCE
55% 63% 69% 71%	Schoolchildren (aged 17–19)	Chile United States England Switzerland	Survey in four countries[48]
36% 39% 41% 42% 51% 54% 56% 60% 71% 72% 74% 76 %	Students	Mexico Israel USA Spain Brazil Turkey Jordan Finland Malaysia United States United States Singapore	[49] [50] Survey in three countries[51] [52] [53] [54] Survey in two countries[55] [56] [57]
58% 58% 74%	Adults	USA Ohio, USA Malaysia	[58] [59] [60]
83%	Teachers	Malaysia	[61]
Mean: 60,2%			

Given this terminological confusion, a scale was developed to accommodate the advanced military environmental concepts involved in the study of MEL. A measure that combines the rating scales of Ehrampoush and Moghadam[62] and Karatekin[63] was developed with scores of ≤ 40% interpreted as 'below standard', 41–60% as 'adequate', 61–79% as 'good' and ≥ 80% as 'excellent' MEK.[64]

In the knowledge scale of the MEL questionnaire, 14 multiple-choice items assess the MEK of participants. Combined or average results for the knowledge scale representing the objective MEK of participants[65] and graphically displayed in histograms[66] form the cornerstone for analytical discussions in this section.

MEK according to the environmental course determinant (2017 results)

The annual military environmental course presented to a small group of soldiers targets military-integrated environmental management and provides contextualised military environmental education and training.[67] The assumption reported on in this subsection is that having completed such courses, the soldiers' environmental knowledge had improved. This would be consistent with a study by Culen and Mony, which found that youths exposed to environmental education activities scored higher on environmental knowledge scales, compared to those without exposure to such activities.[68]

Figure 2: contrasts the knowledge of participants who had completed an environmental course with those who had not. The *F*-test assessed the hypothesis that their knowledge was similar, regardless of whether participants had completed environmental courses or not.
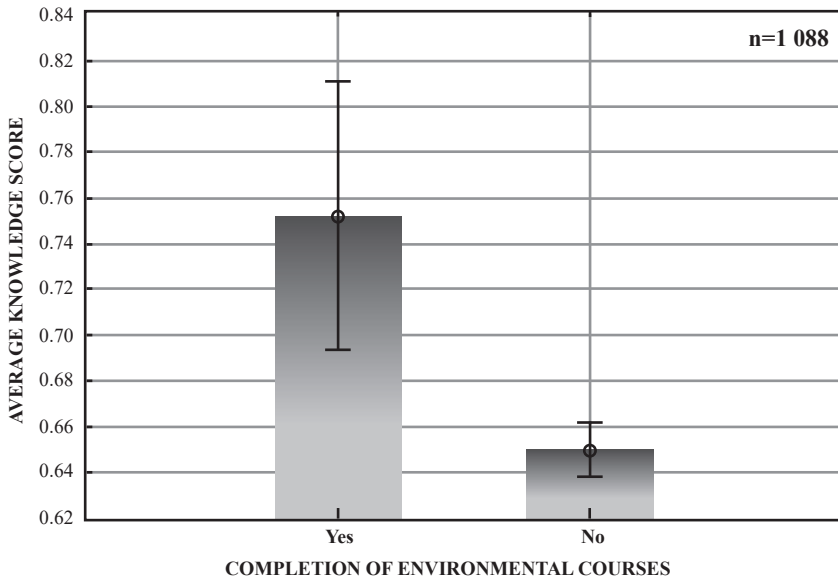

Figure 2 Average environmental knowledge score on completion of environmental courses

(Adapted from Smit, 2017)[69]

The F-statistic ($F_{1, 1088} = 11.3$, $p < 0.01$) shows that this was not the case and that the hypothesis could be rejected. A mean knowledge score of 75% for participants who had completed an environmental course and a mean score of 65% for those who had not underscore the statistically significant difference.[70]

MEK according to the environmental course determinant (2018 results)

The test–retest results for the 2018 survey indicate an excellent 86% MEK among participants prior to attending the military environmental course. This increased slightly to 87% in the post-test. Although this is a similarly small increase to the results of the MEA, the initial knowledge level of 86% was remarkably high, making a substantial increase highly unlikely.

Because of the highly specific military content of the military environmental course, the course improved the MEK of participants to a greater extent than generic education would have done. In the 2017 survey, a 10% difference between participants who had completed the course and those who had not, was recorded. Although a similarly large increase was not achieved in the 2018 survey, the extremely high initial knowledge of the participants probably negated the possibility of a notable increase. This is a significant result, since it indicates a possible avenue for improving the MEK of SA Army soldiers.

Military environmental behaviour (MEB) in the SA Army

Environmental behaviour (EB) comprises the action component of EL, and the term 'environmental action' is sometimes used in the literature as a synonym for environmental behaviour.[71] The behaviour scale of the MEL questionnaire used similar Likert-type response items as for the measurement of attitude; hence, the same statistical techniques were used here.

MEB according to the environmental course determinant (2017 results)

Karakaya, Avgin and Yilmaz conclude that focused environmental education programmes could positively influence EB.[72] Figure 3 contrasts the self-reported behaviour of participants who had completed an environmental course with those who had not. The F-test assessed the hypothesis that behaviour was the same, regardless of attendance of environmental courses. The F-statistic ($F_{1, 1088} = 2.6$, $p = 0.10$) supported
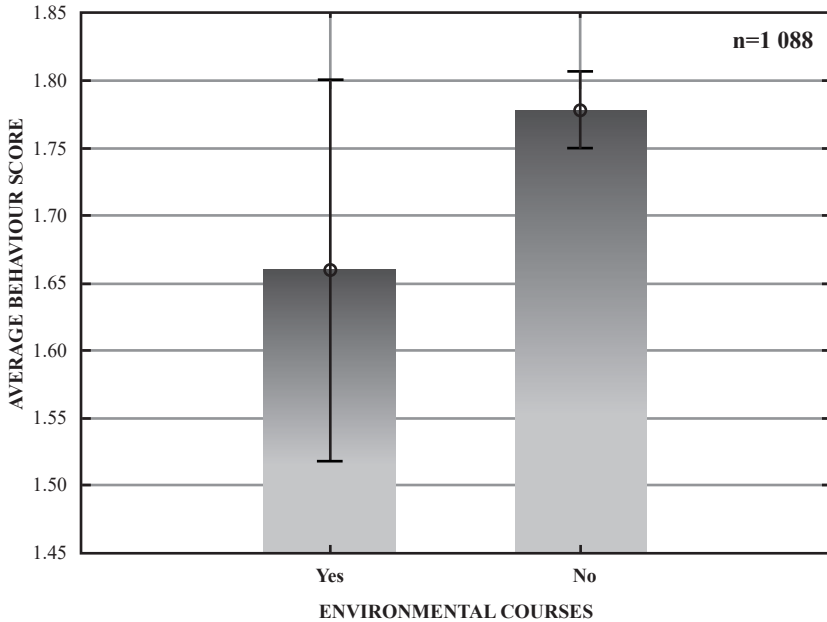
the hypothesis, and it could be accepted.[73]

Figure 3: Average behaviour score on completion of environmental courses

(Adapted from Smit, 2017)[74]

There was indeed no significant difference between the self-reported behaviour among participants who had completed environmental courses, and those who had not. The mean reported behaviour for participants who had completed an environmental course was 1.7, while those who had not completed such a course recorded a mean score of 1.8 on the five-point Likert-type scale. The small difference between the two groups was not statistically significant.

This result differed from the findings about MEA and MEK, namely that the positive attitude and better knowledge gained from military environmental education and training had not translate into positive EB. Kollmuss and Agyeman allege that environmentally conscious environmental attitudes have a limited effect on pro-EB.[75] This view is shared by Gifford who identified 30 psychological barriers to behaviour change.[76] Gifford and Nilsson concur and report 18 personal and social factors mediating and moderating conscious environmental behaviour.[77] To complicate matters further, Klineberg, McKeever and Rothenbach suggest that the use of different components of environmental behaviour to measure EB influences results.[78]

To conclude, environmentally conscious behaviour is a complex construct influenced

in different ways by an array of context-specific independent variables, making the capture of its educational and other behavioural determinants exceedingly difficult.

MEB according to the environmental course determinant (2018 results)

Participants in the 2018 survey scored an average of 2.0 on the Likert-type scale for MEB during the pre-test. After the intervention, a marked improvement to an average score of 1.6 was recorded. This is an interesting result, which indicated that, although participants had a positive attitude towards and good knowledge of military environmental issues prior to completing the course, they did not display a high level of pro-environmental behaviour in the military environment. This is corroborated by the work of Gifford[79] and Gifford and Nilsson.[80]

The statistically significant improvement of MEB recorded in the 2018 survey indicates the importance of a focused military environmental course in bringing about meaningful change in the EB of soldiers. The 2017 survey did not record a statistically significant increase in MEB, something also encountered by other scholars of EL.

Determinants of MEA, MEK and MEB had been investigated and were discussed in the previous sections. Attention now shifts to MEL, the construct derived from a combination of these three components of MEL.

Composite military environmental literacy

A **single, composite EL score** can be calculated, although this is not common practice,[81] because the scientific basis for doing so is still being developed.[82] The usefulness of a composite EL score is, however, to be found in its practical application (for instance to compare similar EL studies or repeat surveys of the same population). McBeth et al. calculated a composite EL score based on results from the National Environmental Literacy Project as a baseline for middle-grade learners in the United States.[83] McBeth et al.[84] also developed a scoring system for composite EL results in which they contend that scores below 40% indicate a low level of EL, between 40% and 70% a moderate level, and above 70%, a high level of EL. McBeth and Volk reported a moderate level of EL for both Grade 6 and Grade 8 participants,[85] and in a follow-up study, McBeth et al. investigated the influence of a dedicated environmental programme on the EL of Grade 6 and 8 participants and compared it to the 2008 results.[86] Although the results showed an improvement in the participants enrolled in the environmental programme, the composite EL results remained moderate for both grades. Karatekin used a five-part environmental literacy questionnaire and the same scoring system[87] as McBeth et al. to test EL levels of pre-service teachers in Turkey and also found a moderate level of EL.[88]

To meet the stated objective of the MEL study to provide a baseline for future studies, a composite MEL score was calculated using the method developed in 2008 by McBeth et al.[89] The questionnaire developed for the MEL study purposely balanced the measurement of the attitude, behaviour and knowledge scales that ranged from 13 to 15 items each, negating the necessity of transforming the scores. However, two of

the scales (attitude and behaviour) used Likert-type questions, while environmental knowledge was scored as a percentage. To calculate a composite MEL score, the Likert-type scores were converted to percentages using the formula: percentage = (Likert-type score minus 1)/4 x 100. The converted Likert-type scores ranged between 0% (value 1) and 100% (value 5). The composite MEL scores were calculated as an average of the three subscales, with the attitude and behaviour scores reversed, where MEL = (100 minus attitude score) + (100 minus behaviour score) + knowledge)/3. These composite MEL scores can be used in comparative studies.

MEL according to the environmental course determinant (2017 results)

Smit et al., Karatekin et al. as well as Karakaya et al. all found a positive correlation between environmental education and training and EL.[90] In all three studies exposure to environmental education and training opportunities led to better EL. The military environmental course, presented each year to a small group of soldiers, focuses attention on military-integrated environmental management and provides contextualised military environmental education and training.[91] Only 4% of the participants in the 2017 survey had completed a military environmental course and their results for both attitude and knowledge were better than those who had not completed such a course. The good knowledge and favourable attitude apparently did not make any difference to the behaviour of the participants in the 2017 survey as no significant difference was found between the two groups for the behaviour scale.[92]

The composite MEL results (yes 81%; no 75%) point to a significant difference in MEL between the two groups with soldiers who had completed the military environmental course outscoring those who had not (see Table 3).[93]

Table 3: Attitude, behaviour, knowledge and MEL for the 2017 survey[94]

	Attitude	Behaviour	Knowledge	MEL
No military environmental course completed	1.8	1.8	65	**75**
Completed military environmental course	1.6	1.7	75	**81**

Of note in this regard is that the MEL of soldiers comprised the construct tested by the MEL questionnaire, and therefore represented the most important result from the surveys. MEA, MEK and MEK are only components of this construct and form the substructure of MEL.

MEL according to the environmental course determinant (2018 results)

In the 2018 survey, a marked improvement in MEL was observed. The pre-test result of 83% was well above the 75% recorded by participants who had not completed the military environmental course according to the 2017 survey (see Table 4). The improvement to 87% correlated well with the improvement recorded in the 2017 survey.

Table 4: Attitude, behaviour, knowledge and MEL scores before and after the military environmental course

	Attitude	Behaviour	Knowledge	MEL
Before	1.5	2.0	86.1	**83**
After	1.5	1.6	87.1	**87**

Conclusion

The two independent surveys – conducted at different scales, temporally removed from each other, and using different methodologies – rendered similar results. According to the results, a focused, dedicated MEM course could significantly improve the MEL of soldiers, something general education cannot accomplish. These results resonate well with examples from literature.

Given the potential negative impact of military activities on the environment, as well as the known complexities of the factors influencing environmentally conscious behaviour, it is imperative that soldiers be regularly exposed to structured education and training programmes aimed at enhancing MEL.

The present five-week course should be made available to more soldiers, possibly by presenting it bi-annually. It should also be considered dividing the course into smaller components that can be presented to soldiers at different junctures in their career path. Early intervention is especially valuable so that soldiers at the lowest levels can realise the impact of their activities on the military environment. In the final instance, the importance of sound MEL should be brought to the attention of the senior management of the South African National Defence Force (SANDF). Since the SANDF is a command-driven organisation, the agreement and approval of the most senior officers is non-negotiable to enhance the good MEL of the SA Army.

As the importance of having environmentally literate soldiers is incontestable, it is imperative that soldiers be exposed to such interventions to ensure good MEL. The good news is that an SA military environmental course of this nature exists and the positive influence of this course on the MEL of SA soldiers is proved by this research. The bad news is that only about 4% of SA soldiers are exposed to this intervention. This is a situation that calls for rectification if the MEL of soldiers is important – and it is.

Acknowledgement

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Review article

LEGISLATIVE DISCONNECT OR INSTITUTIONAL GATEKEEPING? CHALLENGES OF RESEARCHING SOUTH AFRICA'S MILITARY PAST

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Abstract

The Department of Defence Archive in Pretoria is the repository of all military documents generated by the Union Defence Force, the South African Defence Force and the South African National Defence Force. This makes it the foremost source of primary information for researchers of South African military history. However, an almost total ban on access to archival documents from 1 January 1970 onwards complicates research into later periods. In fact, anyone researching post-1970 military-related topics has to apply for access to archival documents through the Promotion of Access to Information Act. The traditional weapon in the armoury of the historian – the systematic trawling of archives – is thereby negated, while the methodology of post-1970 historical research differs significantly from commonly accepted historical practices. Finding aids, the only access route to classified information in this analogue archive, offer only the briefest descriptions of the content of files, and researchers need almost esoteric intuition to identify documents that are even remotely relevant to their research. Additionally, a fee is payable for declassification, and the process can take several months to complete. This review article reports on the theoretical workings of the Promotion of Access to Information Act, and uses an actual research example as a case study to illustrate the practical implications of conducting research at the Department of Defence Archive in South Africa based on classified military documentation.

Keywords: Department of Defence (DoD) Archive, military archives, classified information, Promotion of Access to Information Act (PAIA), Defence Act, gatekeeper mentality

Introduction

Gary Baines cautions that war carries with it an inherent obligation of remembrance. This is especially true, since the residual effects of wars are known to affect societies long after the cessation of hostilities. The obligation to remember, as Baines correctly points out, however, comes with a forewarning. It is more often than not the silence and disinterest of the majority of society that sanctions the few to record the collective past.[3]

He thus recommends that the historian interested in South Africa's so-called 'Border War' – and by inference the broader topic of the War for Southern Africa – should critically engage with the unstable and dynamic power relationships that underpin the collective memory of this turbulent time. As such, three pertinent questions confront the researcher interested in South African military affairs:

- Who are the 'few' sanctioned by society to record the collective military past?
- In which way do they record the military past?
- What are the dominant meanings they ascribe to the military past?[4]

The historiography surrounding the War for Southern Africa passed through five distinct phases that span the levels of war in their methodological approach. The five phases identified by Ian van der Waag and Deon Visser are:

- the so-called 'initial accounts', mostly written by journalists;
- official, government-sanctioned histories;
- campaign or battlefield histories, usually compiled under government auspices;
- regimental histories, often written from within a particular unit; and
- personal accounts or memoirs.

These phases differ vastly from one another in terms of both who writes the history and the specific approach he or she follows. As a result, the methodological approach of each of these phases to record the collective past and build on the historiography of the War for Southern Africa remains quite distinct.[5] The phases exhibit something of a knee-jerk reaction, with governments dissatisfied with the popular images projected by journalists, resulting in their own, officially sanctioned, versions. Individual units frequently feel slighted by official accounts, and write their own regimental histories, which in turn often negate the role of the individual, leading to memoirs. Each of these phases however has a clear motive. The distinction between the phases is exacerbated by the authors associated with the identified phases, and indeed their respective approaches to the phases. According to André Wessels, the vast majority of authors of Border War literature are amateur or popular historians or journalists, with no real historical training or background, a distinct disregard for archival research, and a predominant emphasis on the commercial or popular markets in South Africa. As a mnemonic community of sorts, these authors mainly comprise former national service members and retired generals, with only a small number of trained professional historians involved in studying the broader course of the War.[6]

Despite the above-mentioned attempts, Van der Waag and Visser maintain that the broader history of the War for Southern Africa – and by inference South African military history to a large extent – remains generally unwritten due to several reasons. The principal reasons proposed for this apathy are that "[t]oo little time has lapsed, emotions run high and [the] wounds inflicted are painful, exposed, and they refuse to heal."[7] Alarmingly, this state of affairs continues to persist despite the wealth of primary

sources preserved at the Department of Defence (DoD) Archive in Pretoria. This point has more recently been reaffirmed by scholars such as Abel Esterhuyse, Benjamin Mokoena and Lindy Heinecken.[8] The argument carried by Van der Waag and Visser that "[t]here is hardly an aspect of this history that cannot be interrogated and, as numerous researchers find, query opens the trapdoor to a vast, sunken, documentary labyrinth of a virtually forgotten past" unfortunately comes with somewhat of a caveat.[9] While the DoD Archive indeed contains a vast amount of primary sources documenting the history of the South African National Defence Force (SANDF) and its predecessors, access to the majority of its archival holdings remains restricted – thereby leaving the proverbial trapdoor only partially open to researchers.

The aim of the study on which this article reports, was to examine the theoretical workings of the Promotion of Access to Information Act (PAIA) critically against the backdrop of conducting research at the DoD Archive in South Africa based on classified military documentation. The article first provides a broad overview of the archival holdings of the DoD Archive, before discussing the relevant national and departmental legislation and regulatory frameworks that govern access to classified information. An actual research example is then used as a case study to illustrate the practical implications of conducting research into classified military documentation at the DoD Archive. The article concludes with several proposals offered by the authors to address the most pressing challenges in conducting research into classified material at the DoD Archive.

The DoD Archive – a tentative breakdown of the archival holdings

The DoD Archive in Pretoria, also known as the DoD Documentation Centre, is the custodian of all military documents generated by the DoD since the inception of the department in 1912.[10] The archive contains extremely valuable primary sources, numbering some 3 038 archival groups and comprising nearly 38 linear kilometres of archival material. Supplemental to this, the DoD Archive also preserves the personnel records of former soldiers, which amounts to another 30 odd linear kilometres of material. All told, the holdings of the DoD Archive thus total some 68 linear kilometres. The archival material naturally details South Africa's military past over the preceding century (1912-2020), and includes valuable documentation on the country's participation in both world wars, the Korean War, as well as the broader ambit of the so-called War for Southern Africa (see Graph 1).[11] The DoD Archive is thus the first port of call for both professional and amateur researchers of South African military history.
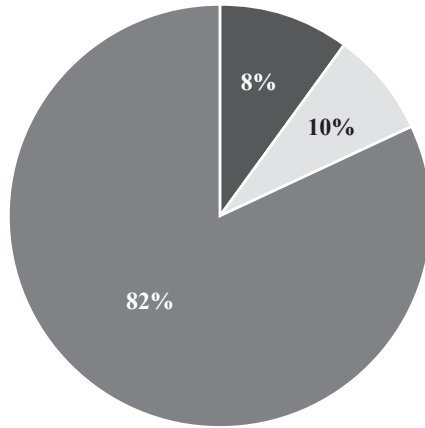
Graph 1: Approximate periodic breakdown of the holdings of the DoD Archive[12]

Records in the DoD Archive generally fall into two distinct categories – classified and declassified material. The former is subdivided into top secret, secret, classified, and restricted documents. All records in the DoD Archive relating to military operations and administrative matters created up to and including 31 December 1969 are deemed open and declassified, and are thus automatically available to researchers. This includes all archives related to the establishment of the Union Defence Force (UDF), both world wars, and the Korean War. A further exception is made for all correspondence files classified as restricted that were created up to and including 31 December 1975. All archival documents falling outside these periods, regardless of their security classifications are thus automatically deemed classified and therefore largely inaccessible to researchers.[13]

Unfortunately, such broad statements are in fact meaningless, and need clarification in order to make sense of the amount of material that is indeed classified or declassified. An exploratory breakdown of the actual accessibility of the archival collections housed at the DoD Archive, based on the so-called archival Master List and its related metadata, yields several important statistics (see Graph 2). At a cursory glance, at least 42% of the archival collections are classified and thus outright restricted and only 11% deemed declassified and open to researchers. A further 16% of the archival collections contain documents that fall both within and outside the classified periods. Astonishingly, the archival Master List fails to identify the individual periods of nearly 31% of the archival collections.[14]
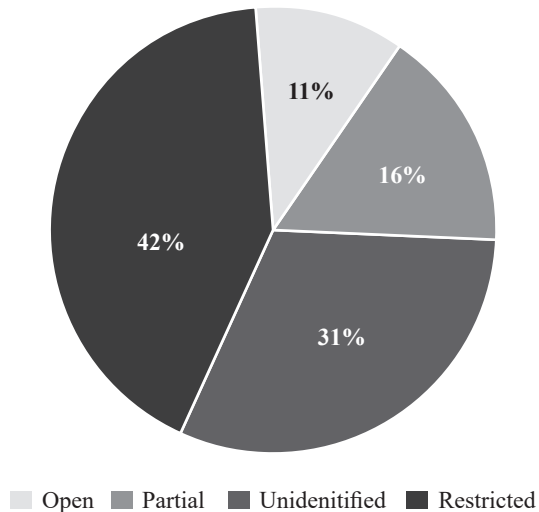
Graph 2: Tentative accessibility of the archival collections housed at the DoD Archive[15]

A reworking of some of the statistics however allows for a more refined appreciation. Based on the fact that the majority of the archival collections with unidentified periods indeed contain primary material relating to the broader War for Southern Africa, at least 65–70% of the overall archival collections are deemed classified with restricted access. Moreover, this number can be inflated to roughly 80% when the status of the archival collections falling into the partial period is reworked in terms of classified or declassified material. The reworked statistics – save for a few per cent on either side – in fact correlate with those of Van der Waag and Visser expressed in Graph 1. Researchers are thus only assured of immediate access to an estimated 20% of the primary sources housed within the DoD Archive. Access to the remaining 80% of classified archival material is principally regulated by the provisions of the PAIA, as well as other legislative and regulatory frameworks.

These figures stand in stark contrast to those proposed by Wessels in 2017. While Wessels obtained his information from a former director of the DoD Archive as far back as 2013, the statistics Wessels quoted simply do not add up – especially not when compared to the aforementioned graphs and statistics. Wessels suggests:

> [A]pproximately 750 000 of the some seven million records kept … deal with the years of conflict, 1966 to 1989, and … approximately 45% have already been declassified … [A] total of probably more than 50 million pages of archival material is already available[16]

It is impossible for 38 linear kilometres of documents to add up to a mere seven million records. Moreover, the vast majority of the archival holdings – far in excess of the quoted 750 000 records – in fact deal with the broader War for Southern Africa. While Wessels cannot be blamed for the statistical errors he quoted in his article, it becomes undeniably clear that even within the DoD Archive, there was, and still is, no real consensus over the breakdown or the accessibility of its archival holdings.

Accessing classified military information: legislation and procedures

When one accepts our argument above, that the vast majority of the archival material preserved at the DoD Archive is in fact restricted, it is important to note that there are, however, legal mechanisms and administrative procedures in place to govern and facilitate access to this archival material. Three legal documents underpin the continued debate on access to classified military documentation held by the DoD Archive, and these deserve brief mention.

First and foremost, the Constitution of the Republic of South Africa (1996), addresses several key aspects that form the foundation of any discussion of access to information in general. Section 32 of the Constitution states in no uncertain terms that all South Africans have the inherent right to access any information held by the state. Moreover, section 32 maintains that national legislation must be enacted to give effect to the inherent right of access to information.[17]

Second, the South African Defence Act (No. 42 of 2002) provides key insights about the mandate of the DoD Archive, with specific provisions on the accessibility of information preserved at the archive. Section 83 of the act specifically deals with the 'protection of defence assets'. The section states that the DoD Archive exists under the provisions of the National Archives of South Africa Act (No. 43 of 1996), albeit with a number of exceptions. First, the DoD Archive falls under the management and care of the DoD, and no record preserved in this archive may be transferred to the National Archives.[18] Section 83 of the act further regulates that, according to the provisions of the PAIA:

> No record may be available for public access until a period of 20 years has elapsed since the end of the year in which the record came into existence, which period may be extended by the Minister in the interests of national security; access to records which have been in existence for less than 20 years can only be obtained subject to such conditions as may be determined by the Secretary for Defence.[19]

Section 83 of the Defence Act seems to imply a blanket declassification protocol. Unless the Minister extends the 20-year period, the Defence Act does not indicate any reason why documents cannot summarily be declassified after the required time had lapsed. The potential implication for researchers is considerable: after 20 years, the Defence Act suggests that the onus shifts from the researcher motivating why access to a specific document *should be given*, to the DoD motivating why access *should be denied*.

This concept dovetails neatly with the third legislative document that regulates access to classified documents, the PAIA.

Act 2 of 2000, the PAIA, provides clear guidelines on which grounds the DoD may refuse access to archival documents preserved in the DoD Archive. Section 41 of the act, in particular, contains specific provisions on the 'defence, security and international relations of the Republic'. The section asserts that the information officer of a public body can refuse a request for access to documentation held by the body, especially if its disclosure could adversely affect the defence, security and international relations of the Republic. In such an event, the information officer needs to provide specific reasons – as per the specifications of section 41 – why the access to documentation is refused. The section also specifies that, in instances where the DoD may choose to refuse access to classified information, whether such information indeed exists or not, the information officer may refuse to either confirm or deny the existence or non-existence of such records. The section does, however, state that the requester may lodge an internal appeal or even lodge an application with a court against the refusal of access by the state.[20]

The DoD regularly publishes its own PAIA Manual, which is available on the department's official website. The aim of the PAIA Manual (the Manual) is to:

> [E]nable any member of the public to view the description of the records in the possession of the Department of Defence and [the Manual] contains procedures on how to obtain the information/records whether automatically available or not.[21]

The Manual also outlines the theoretical process of gaining access to classified archival material (see Diagram 1).
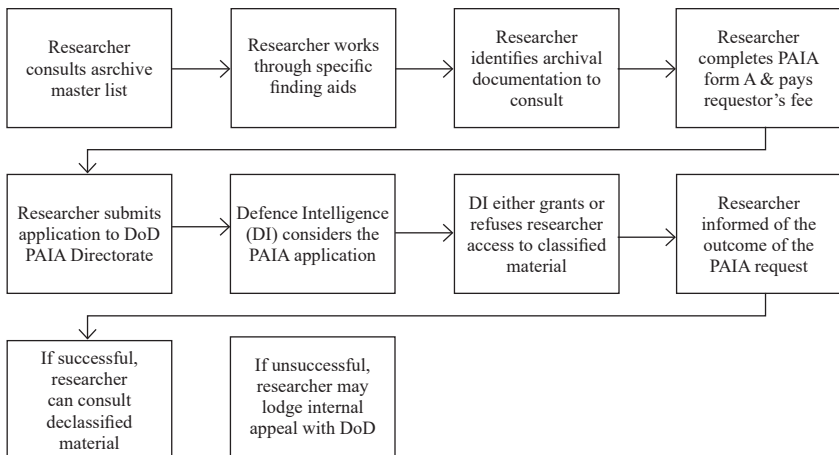

Diagram 1: Theoretical process of accessing classified material in the DoD Archive

The DoD PAIA Manual furthermore lists all categories of records automatically available to researchers for inspection and copying. This list also includes a number of official DoD publications, including the Defence Act (2002), the White Paper on National Defence for the Republic of South Africa May (1996), DoD instructions, policies, annual reports, strategic plans and information bulletins that are available to researchers for perusal. A number of corporate communication publications are also automatically available. The Manual further lists well over 100 separate military operations, whose documentation is automatically available to researchers for perusal. Under each individual operation, the file reference of the applicable letter from Defence Intelligence authorising the release of the files is mentioned, although the actual extent of material declassified is not mentioned. It is, however, unclear whether these letters are in fact available for consultation to both researchers and the staff in the Reading Room. If not, then this information in the Manual remains rather irrelevant, as one would still need to determine the location and extent of these documents within the broader archive.[22]

There is also no single list available at the DoD Archive that catalogues all declassified archival material. Due to questionable administration, or perhaps even muddled bureaucracy, researchers thus run the risk of unknowingly applying for the declassifying of a document, when such a document may already be declassified and freely available to consult. Alarmingly, researchers are thus at the complete mercy of the Reading Room staff who, as a result of understaffing, may or may not draw the relevant material in order to establish whether a document is in fact declassified before the PAIA route is followed. This carries with it both ethical considerations and financial implications.

Table 1: Index to the DoD filing system[23]

File reference	Description
100	**PERSONNEL** – the series of records consists of references, which cover the full spectrum of human resource management in the DoD. This includes recruitment, appointment and employment, education, training and development; career planning, remuneration and performance assessment; SANDF ranks and rank structures, equal opportunities and affirmative action matters; discipline, military justice and labour relations; termination of service, discharge and pension matters.
200	**INTELLIGENCE** – the series of records pertains to military intelligence. This includes all military intelligence policies, security of persons, information and facilities; the collection of information through various means; intelligence appreciations, forecasts of threats, intelligence reports and interdepartmental intelligence affairs.

300	**OPERATIONS** – the series refers to the records on military operations. It covers a wide array of topics, including strategic planning and appreciations; order of battle, mobilisation and demobilisation, conventional and unconventional warfare as well as specific operations; air and maritime defence; search and rescue operations and training exercises; assistance to and co-operation with other institutions and countries.
400	**LOGISTICS** – the series of records includes all matters related to the logistics of the DoD. In this widest sense, it entails the aspects of military operations dealing with research, design and development, acquisition, storage, distribution, maintenance, evacuation and disposal of material; acquisition or erection, maintenance, operation and disposal of facilities; as well as acquisition or provision of services.
500	**DEPARTMENTAL MANAGEMENT** – this is a comprehensive series encompassing all departmental management aspects. These include command and control; organisational control including the establishment and/or disestablishment of force structure elements; the DoD budget and auditing; ceremonial and heritage matters; records management; and information, communication and technology systems of the DoD.

Researchers are also required to make use of archival finding aids to locate the information they are looking for in the DoD Archive. These lists are all available in paper format, with no electronic database available to expedite research or simply pinpoint information. Generally speaking, each archival group has its own finding aid. The information listed in the finding aid thus reflects the actual information preserved in each archival group. Moreover, each document listed in a finding aid has accompanying metadata, which includes a unique file reference (see Table 1) as well as a brief description of the document and its date range. Unfortunately, file references are not uniformly used across the defence force, and have changed considerably during the past century. Researchers have no choice but to consult these lists in order to identify the particular records they require. The finding aids, unsurprisingly, do not indicate the status of a document in terms of its classification. Simply put, there is thus no easy way to locate the information in the DoD Archive that falls into the classified period.

32 Battalion – A case study on contemporary military research

A case study is an effective way of testing the theories, outlined in the first part of this article, in practice. To this end, a unit like 32 Battalion, which was involved in the Border War for its entire duration, makes an ideal topic.

Master List

Any researcher who has visited the DoD Archive will know that the starting point for a new research project is the Master List – essentially a directory of the finding aids available at the archive. The Master List contains the names and abbreviations of archival groups, along with a host of accompanying metadata, such as physical extent and period covered. Fortunately, this list is declassified and completely accessible. Researchers can thus identify which finding aids they would like to consult. Unfortunately, this simple process is far more complicated than it seems at first. In the case of 32 Battalion, the obvious finding aids to consult are the actual 32 Battalion archival groups. These five groups contain 629 boxes, or just under 70 linear meters, of documents. However, anyone with a basic knowledge of the Border War, willing to consult all 178 pages of the Master List, will readily be able to identify at least 3 000 additional boxes (333 linear meters) that may contain relevant information. Table 2 indicates the archival groups that are immediately identifiable with 32 Battalion, as they are found in the List of Lists.

Table 2: Archival groups immediately identifiable with 32 Battalion

Archival group	Boxes	Dates
1 Military area	191	1965–1979
1 Military area	236	1959–1976
1 Military area	13	1975–1979
1 Military area sector 20	246	1977–1987
101 Task force	17	1974–1977
101 Task force	175	1975–1977
2 Military area	275	1973–1978
32 Battalion	135	1977–1989
32 Battalion	126	1976–1989
32 Battalion	167	1979–1988
32 Battalion	68	1976–1979
32 Battalion	133	1977–1988
Operation Protea	29	1980–1981
Operation Savannah	5	N/A
Savannah	29	N/A
Sector 10	559	1976–1987
Sector 10 Headquarters Intelligence	108	1979–1989
Sector 10 Headquarters	15	1977–1989
Sector 10 Headquarters	344	1977–1989

Sector 10 Operations	438	N/A
Sector 20	98	1977–1989
Sector 20	213	1977–1989
Sector 20 Headquarters	15	1977–1989
Sector 20 Headquarters Intelligence	60	1980–1989
Sector 20 Headquarters	76	1974–1989
TOTAL	**3 771**	

Secondary sources on 32 Battalion can easily fill a shelf in a researcher's library. Few of these, however, are useful in leading a researcher to primary sources. Piet Nortje's two volumes on 32 Battalion[24] are notable exceptions for providing a list of archival documents that the author consulted, even though there is no traceable reference method. Consulting these and other secondary sources soon leads the researcher to the realisation that the DoD Archive has much more information about 32 Battalion than the initial impression from the List of Lists. Table 3 contains a list of archival groups that also contain documents relating to 32 Battalion, based on references from secondary sources and links found in the more obvious groups.

Table 3: Supplementary archival groups related to 32 Battalion

Archival group	Boxes	Dates
Chief of Staff Operations Group 1	97	1966–1977
Military Intelligence Division Group 8	43	1977–1983
Sector 10 Training Unit Group 3	62	1982–1989
Sector 20 Headquarters Itsa	26	1980–1989
South West Africa Command Headquarters	1 133	N/A
South West Africa Command Headquarters Operations	19	1975–1978
South West Africa Territory Force Hq Sub Div Count Int	131	N/A
South West Africa Headquarters Intelligence	143	1969–1980
South West Africa Territory Force Headquarters Intelligence	246	1978–1989
South West Africa Territory Force Headquarters Intelligence Group 3	48	N/A
South West Africa Territory Force Headquarters Operation	135	N/A
South West Africa Territory Force Headquarters Comops Battalion	157	N/A
Oelschig Collection	16	1992–1994
TOTAL	**2 256**	

Combining the 2 256 boxes, or 250 linear meters, of documents in Table 3 with those in Table 2, leaves the researcher with more than 600 linear meters of documents to consult. This is a daunting undertaking, but one that archival researchers relish: the opportunity to spend countless hours trawling through endless documents in the hope of a Eureka moment. It only needs a cursory glance at the dates in Tables 2 and 3, however, to realise that very few of the documents are not covered by the blanket classification on documents dated later than 1970. The PAIA manual indicates that documents relating to Operations Savannah and Protea have been declassified, but it does not indicate *which* documents these are. Researchers cannot therefore know whether the documents they require are among those accessible, and the column in the Manual labelled "Manner of access to records" is ominously blank.[25] Trawling, then, is out of the question. The researcher needs to turn to the finding aids of the archival groups that were identified to narrow down the search.

Finding aids

While it is, theoretically, possible to apply under the PAIA to have all the documents listed above declassified, time and budget constraints make this practically impossible. It will take many years (if not decades) and have huge financial implications to have such a vast number of documents declassified. This means that researchers need to identify potentially valuable documents by using the finding aids that were identified in the List of Lists. All finding aids are declassified and are fully accessible to researchers. Finding aids contain the box number of each individual file in the particular archival group, the file number and volume, a brief description of the content of the file and the dates covered by the file. While this sounds like much information on which researchers could base their PAIA applications, in reality the descriptions are often too brief or not informative. A typical description might be "Personeelbestuur"[26] (personnel management), without any indication about the nature of the management. While this is not a particular problem with declassified or unclassified documents, applying for declassification based on a single word is risky at best. There is no way for the researcher to know whether this particular file deals with personnel transfers, remuneration, leave allowances or any other personnel matter. Depending on the nature of the research being conducted, the file might, therefore, be extremely valuable or completely useless.

Another, similarly ambiguous file description is "RVO",[27] the Afrikaans abbreviation for "Rade van Ondersoek" (boards of enquiry). A researcher interested in the legal system of 32 Battalion will probably find this file valuable regardless of the content. Someone with a narrower interest, though, is in the same situation as the researcher with the personnel management file, with little indication of which particular board of enquiry is contained in the file. By making use of the date indication in the finding aid (in this case "11/1/78–11/1/78"), a knowledgeable researcher is able to predict, to an extent, what a file is likely to contain. It is, however, little more than an educated guess, and certainly no guarantee that it will be worth the time, effort and cost involved in having the file declassified.

The SADF also used a number of 'standard' file descriptions, of which "konferensies, kongresse, seminare, simposiums en vergaderings"[28] (conferences, congresses, seminars, symposiums and meetings) is a particularly frustrating example. Documents in these files range from discussions on the diversity of alcohol available in the unit canteen to operational requirements and logistics. Once again, the researcher has no way of knowing which particular file – there are several dozen files with this description in the 32 Battalion archival groups alone – will be valuable and which will not. Nonetheless, at this point, the researcher has to make a decision about which files to include in the PAIA application, as there are no further avenues to explore.

Documents

Once the PAIA application has been finalised – probably between two and six months later – the researcher can return to the DoD Archive and access the documents that have been declassified. Unless the research topic is particularly sensitive, it is likely that the majority of the documents requested will be available. In the case of one of the author's applications, 137 files were declassified and only ten were refused.[29] At this point, for the first time, researchers are able to view the content of the files that they identified several months before. Some of these files will hopefully contain useable information. Other will have some information that is not useful. Yet others however will not contain any relevant information whatsoever. The following two examples serve to illustrate this point.

In the first case, the finding aid for the archival group 32 Battalion, Group 3, indicates that file 106/19/16/1 in box 42 contains information about "Personeelbeheer: Dissipline: Onsedelikheid: Homoseksualisme" (control of personnel: discipline: immorality: homosexualism).[30] This description is much more comprehensive than many others, and someone conducting research about, for example, sexuality in the SADF would be justified in thinking that this would be a particularly useful file to consult. Upon receiving the declassified file, the researcher would find that the description is echoed, verbatim, on the file cover. However, the documents contained in the file are exclusively about retraining and reinforcement of national service members and bear no relation whatsoever to the description on the cover and in the finding aid.[31]

In the second case, incidentally again from the 32 Battalion, Group 3 archival group, the description of file 309/1 is "Spesifieke Operasies: SA Leër Agree"[32] (specific operations: SA Army Agree). The logical assumption is that this file deals with Operation Agree, part of the South African planned withdrawal from Namibia in 1989. A comparison of the description with the file number supports this assumption, as file numbers in the 300 range are related to operations (cf. Table 1).[33] Researchers interested in, inter alia, the latter phase of the Border War or South African Defence Force (SADF) operations during the War should theoretically find useful information in this file. The file does, indeed, contain information about a 32 Battalion operation, Operation Potjie. None of the secondary literature on 32 Battalion has any reference to this particular operation, and it soon becomes apparent why: Operation Potjie was a *potjiekos* (a traditional South African stew, typically cooked in a cast-iron pot over an open fire)

competition.[34] It was never an actual SADF operation, and the document contains no information about SADF operations.

While experiences such as these make for entertaining fireside anecdotes to researchers using declassified documents, the humorous aspect is somewhat diminished when these experiences happen in terms of classified documents. Not only would researchers have had to pay for the declassification of a completely useless file, but they would also have had to wait several months in anticipation of gaining access to information pertaining to their research – only to find that the wait was in vain. While the two examples illustrated here are extreme cases, many other files are of equally dubious value, either because they do not contain information relating to the researcher's topic, or because the information is not relevant.

Legislative disconnect or institutional gatekeeping?

If one takes the aforementioned discussion into consideration, the answers to Baines's original questions become somewhat clearer. The so-called 'few' sanctioned by society to record South Africa's collective military past comprise only a handful of professional and amateur historians. Of these, only a select few have written on the War for Southern Africa. The principal reasons for this state of affairs are to a large degree the evident legislative and administrative stumbling blocks associated with research into the classified periods at the DoD Archive. As a result, the majority of popular and professional historians simply revisit formerly declassified archival material instead of navigating the pitfalls of the PAIA in an attempt to get to 'new' information. It is thus also no surprise that the vast majority of authors of 'Border War' literature continue to remain amateur or popular historians or journalists, who flood the market with so-called 'personal accounts' or popular histories. Their distinct disregard for archival research in this regard works in their favour. The recording of the War for Southern Africa thus continues to remain somewhat of a missed opportunity, and will remain so until the apparent legislative disconnect or institutional gatekeeping at the DoD Archive is addressed.

The DoD Archive has faced some stern criticism over the past decade or so due to current declassification processes still in place. The criticism at times may have been undeserving, or rather levelled at the wrong entity.[35] While the DoD Archive is indeed at the centre of the problem due to its preservation of the actual classified material, it only executes both national and departmental legislation. Moreover, the actual periods that are considered open or classified remain the domain of Defence Intelligence and not that of the DoD Archive. The fact of the matter is, however, that the current provisions of the PAIA, and its practical application at the DoD Archive, inhibit access to information rather than promote it. As a result, one may even argue that in essence, apartheid secrets are being preserved ad infinitum.

In order to remedy the observed legislative disconnect or institutional gatekeeping at the DoD Archive, the authors propose the following:

- A single, consolidated list of previously declassified material should be drawn up at the DoD Archive and be made available to researchers to consult in the Reading Room. This list should be updated continuously as new material is released. Researchers who are after more general sources on the War for Southern Africa may then opt rather to consult some of the already declassified material instead of following the PAIA route. This, after all, is nothing more than good archival practice.

- The DoD Archive needs a functioning website where the Master List as well as any digital finding aids is made available for researchers to consult. The list of declassified documentation should also be made available on the website. Potential researchers will thus have the ability to predetermine which files they wish to consult, and will not have to journey to Pretoria simply to identify the files they want to declassify. The current state of affairs, especially when considering international researchers, remains untenable.

- Defence Intelligence, in consultation with the DoD Archive and subject matter experts, such as military historians and archivists, should revisit the retention periods of archival documents. If the 20-year rule were followed, for instance, researchers would currently have been able to critically engage with archival documents on Operation Boleas – the first combat deployment of the SANDF after 1994. While such a blanket approach to the lifting of embargoes is not feasible, especially when the specific provisions of the PAIA are taken into account, drastic measures are required to readdress the access to classified material in the DoD Archive. For a start, the authors propose that the retention periods be lifted to 31 December 1989, save for sensitive information contained in select archival groups. This would mean that all strategic and operational documents of the so-called 'Border War' would be declassified outright – a definite move in the right direction. Defence Intelligence should be spending their time determining which files need to remain classified rather than examining files for declassification, as is currently the case. Section 83 of the Defence Act (2002) makes provision for such a step.

Conclusion

It is clear that historical enquiry about the Border War and the War for Southern Africa poses significant challenges. At face value, the PAIA seems to be a researcher's ally; the very name of the Act suggests that it exists to further access to information. This suggests that historians' struggles must then be due to institutional gatekeeping. However, practical experience at the DoD Archive suggests that the difficulties and delays experienced with the declassification process are perhaps due to understaffing and poor archival practices rather than a definite gatekeeper mentality. Thus the most likely, albeit oversimplified, explanation for the current state of affairs is a disconnect between the applicable laws and the practical execution thereof. Both legislation and DoD Archive officials in theory appear geared towards assisting researchers and facilitating

research on the War for Southern Africa, but in practice, the process is still convoluted, complicated and definitely not user-friendly, particularly when it comes to interpreting the three different applicable laws. The authors' suggestions above are certainly not a comprehensive solution to the problem, but rather executable steps towards a greater goal that could make an immediate difference and, hopefully, contribute to increased research about an important part of South African military history.

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ENDNOTES

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2 Will Gordon holds a PhD in history from Stellenbosch University. He has an interest in the Cold War in Africa, the wars for Southern Africa, and the South African involvement in the world wars. He currently teaches high school history.

3 G Baines. *South Africa's 'Border War': Contested narratives and conflicting memories*. London: Bloomsbury, 2015, 1.

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22 *Ibid*., pp. 15–26.

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24 P Nortje. *The terrible ones: A complete history of 32 Battalion.* Cape Town: Zebra, 2012.

25 DoD, *Promotion of access to information manual op. cit.*, p. 24.

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27 DoD Archive, 32 Bn, Box 56, File 106/3, RVO.

28 E.g. DoD Archive, 32 Bn Gp 2, Box 260, File 522/1, Vol. 1, Konferensies, Kongresse, Seminare, Simposiums en Vergaderings / Konferensies.

29 Author's personal correspondence, DoD letter DS/DEISMD/R/202/3/7, 20 August 2015.

30 DoD Archive, Finding Aid: 32 Battalion, Group 3.

31 DoD Archive, 32 Bn Gp 3, Box 42, File 109/19/16/1, Vol. 1, Personeelbeheer / Dissipline / Onsedelikheid / Homoseksualisme, Hoof van die Leër Bevelsdirektief No. GS1/26/83.

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Book Review

ANATOMY OF POST-COMMUNIST EUROPEAN DEFENSE INSTITUTIONS:

THE MIRAGE OF MILITARY MODERNITY

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In *Anatomy of post-communist European defense institutions: The mirage of military modernity*, Thomas-Durell Young's aim was to determine why Central and Eastern European (CEE) states have failed to apply democratic defence governance concepts, despite 25 years of Western assistance programmes. Young provides an in-depth comparative analysis of the impact of Western defence reform programmes on CEE states, from the end of the Cold War to circa 2015, which is of great theoretical importance for South African defence planners. The United States (US) and other members of the North Atlantic Treaty Organisation (NATO) have been extensively involved in providing education, training and technical assistance as part of defence reform programmes for CEE states.[1] In this book, CEE states cover certain former Soviet Union states (Armenia, Azerbaijan, Georgia, Moldova, Ukraine and the Baltic States), former Warsaw Pact countries (Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia) as well as former Yugoslav republics.[2] However, it excludes Albania, Belarus, Kosovo and Russia.[3] The 'three typologies' in this book thus refer to former Soviet Union, Warsaw Pact and Yugoslavian countries.

Young points out that, despite all the exposure to Western planning methods, training and education, as well as participation in NATO exercises and operations, CEE states in general have not been able to establish the ability to do proper defence planning, mainly due to the continued impact of communist-inspired concepts.[4] To achieve the aim, Young covers five key aspects as underlying questions within each typology.[5] Firstly, an overview is provided of the thinking and institutional capabilities of defence institutions in CEE states, by comparing these to democratic Western defence concepts and practices.

Secondly, the obstacles that inhibited defence reforms are identified. Thirdly, Western policy and methods during assistance programmes are critically evaluated. Fourthly, the influence of these programmes towards instilling democratic defence governance concepts in CEE states is assessed. Lastly, Young wants to determine what both Western and CEE states have to do differently in order to achieve more effective defence reform in CEE states – at a faster pace.

To shed light on the unaffordability of and strategic imbalance in CEE defence organisations, Young explains that, within the communist model, the military enjoys special benefits not offered to the rest of society.[6] The embedded heavy reliance on mass regarding troops, equipment and logistics for operational success in CEE states, inhibits awareness about costing in general and using resources sparingly and cost-effectively.[7] With this systematic focus on mass and quantity, the life and value of the individual soldier (especially under communism) are expendable, whereas in democracies, the individual citizen soldier forms part of democratic society, which enjoys fundamental freedoms and rights, including the right to vote, debate military affairs and ask questions about military spending. The absence of critical thinking and debate in communist militaries stifles renewal and innovation.[8] Young argues that, since CEE states still apply communist legacy concepts, including rigid centralised command, their defence policy documents have little effect on implementation, defence outcomes and spending.[9] They lack operational focus, cannot stay within their limited defence budgets and overspend on cumbersome personnel structures. This leaves them with too little operating funds for field exercises and maintaining prime mission equipment (e.g. fighter aircraft). Subsequently many CEE states have "hollow" units, low operational readiness, aircraft that cannot fly, pilots with insufficient flying hours, and capital projects that are unnecessarily delayed.[10] Most CEE states are still stuck with Cold War-era equipment as a financial, logistic and doctrinal yoke.[11] While countries like Poland, Romania and Slovenia have not been in constant decline regarding defence capabilities and capacity, all CEE states have capability gaps and serious defence planning shortcomings that severely affect their ability to lead and manage defence organisations optimally.[12]

Young warns that the incoherent and weak policies, strategies and capabilities of CEE countries present significant risks to NATO's deterrence and readiness within the context of increasing Russian assertiveness, as displayed in the Crimea, Eastern Ukraine, Syria and other regions.[13] Moreover, Young argues that the tendency of CEE states to hold onto static and localised Cold War-era territorial (conventional) defence capabilities and infrastructure, reduces their ability to be functional, integrated NATO allies in collective defence, which depends on rapid reaction and manoeuvre.[14] These shortcomings in CEE military capabilities[15] have created dependence on Western support and resources for deployability,[16] and have become an unfunded liability for NATO on its most vulnerable side.[17]

Although Young writes mainly from an American perspective, this book is critical of the discreet and overenthusiastic Western approaches and expensive initiatives to assist CEE countries, without understanding the multiplicity and magnitude of challenges that these defence organisations have experienced following democratisation.[18] Young

emphasises that the problem of a lack of reform can be understood only if the conceptual frameworks, political context, organisational culture and disincentives for change are understood and addressed.[19] This presumes an internal realisation and steadfast political will within CEE states that they must change their old paradigms.

Young's recommendations for more appropriate advice and assistance programmes are relevant to other countries that underwent democratic regime change. Firstly, he emphasises that all role players and stakeholders at national level with strategic partners have to delineate the unique realities and conceptual challenges they face honestly, and should direct defence reform as a political intervention throughout the entire hierarchy of defence organisations, and not just through easy military-to-military programmes. This requires fine diplomatic footwork and hands-on leadership between unequal defence partners to solve major tensions and turf wars to protect vested interests.[20] Secondly, the inappropriateness of US defence planning models and tools for CEE states is strongly criticised, and Young argues that each country should rather develop simple, tailored defence planning methods and tools, according to their unique needs. Thirdly, civil–military relations in CEE states had to be rebalanced following democratic regime change. To help address this, Young emphasises capacity building for defence ministries and civilian defence officials as a critical success factor for democratic institutional reform and enhanced defence policy and planning expertise.[21] Fourthly, militaries in CEE states tend to develop unrealistic long-term visions and strategies, with pipedream force designs that are not costed and which cannot be afforded. Young recommends that, in the short and medium term, CEE militaries should rather build cohesive, operational units that can perform all their combat and support functions in the field during live exercises and operations. Lastly, he argues that defence budgets should be divided in thirds in terms of spending on personnel, capital projects and operating costs, as opposed to the ratio of 40:30:30 that is often prescribed.

There are a few points of critique. Firstly, while Western norms and defence concepts serve an important theoretical purpose to illustrate the shortcomings of CEE militaries, this book creates the impression that Western militaries do not at times struggle with similar problems as former communist militaries, albeit on a smaller scale and in a less fundamental way. For example, after the Vietnam War (1965–1973), the United States had a major civil–military gap and a 'hollow' military that had to be professionalised. History has shown that even Western countries sometimes have to revisit what has made militaries effective and efficient in the past, especially by studying so-called 'paradigm armies'.[22] Militaries can respond to change (or the need thereof) in several ways, varying from rebuilding deteriorated institutions to imitating and importing new ideas, introducing or adapting new ideas through innovation, or stagnation (stasis).[23] Secondly, Young does not unpack the dilemmas and indecision of CEE states on whether they should focus on self-reliant territorial defence for national defence, or on NATO's expeditionary capabilities. In other words, Young assumes that NATO's approach is best for CEE states, but he does not substantiate it. Thirdly, the argument that Soviet-designed legacy military equipment forms part of the problem that CEE states cannot rid themselves of communist legacy concepts, is not fully explained. There are doctrinal and technical reasons that could have been explored in addition to the conceptual and

logistic arguments. This criticism is minor considering the thoroughness of the research and synthesis in this publication.

The empirical depth and comparative theoretical value of the book are quite extensive, since the book is not only based on Young's detailed multi-level research on the policies and strategies of CEE states, but also on his personal involvement in examining the influence of the above-mentioned typologies, as well as experience in trying to assist CEE governments with defence reforms.[24] The overall conclusion of this book is that formerly undemocratic, highly centralised, communist-inspired and doctrinally inflexible defence organisations will face a long and difficult road towards implementing Western democratic defence reforms, which cannot succeed without politicians who vigorously steer and enforce defence organisations to change. This book is recommended for defence legislators, civilian officials within the defence and security community, defence planners, joint and service college staff and students, senior officers, and postgraduate students within the field of strategic studies. The above-mentioned defence challenges that CEE states face should ring a familiar bell to the South African defence community, which should also attentively read this book.

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ENDNOTES

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4 *Ibid.*, p. 2.

5 *Ibid.*, p. 5.

6 *Ibid.*, p. 40.

7 *Ibid*.

8 *Ibid.*, pp. 53–54.

9 *Ibid.*, p. 3.

10 *Ibid.*, pp. 3, 5.

11 *Ibid.*, p. 2.

12 *Ibid.*, p. 1.

13 *Ibid.*, p. xiii.

14 *Ibid.*, pp. 64, 70.

15 *Ibid.*, p. 2.

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Book Review

WAR, AGGRESSION AND SELF-DEFENCE

Yoram Dinstein

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This review is written against the background of the continuing Syrian conflict, and specifically Operation Peace Spring, the Turkish military intervention in northern Syria ostensibly aimed at creating a safe zone there for the resettlement of Syrian refugees present on Turkish territory. In terms of international law, the legality of this Turkish action has been analysed in some detail by a number of commentators and analysts in the popular media and on academic websites and blogs, illustrating that the branch of international law known as the *jus ad bellum* – the law with respect to the legality of war – remains one of the most dynamic and interesting fields of international law and international relations.

Compared to a previous era, when most armed conflicts involved armed forces of opposing states, most contemporary conflicts are so-called 'new wars', conducted by loose and fluid state-related and non-state groups, often with a cross-border character.[1] This evolution of war feeds dynamic discourses on the *jus ad bellum* and related topics, resulting in a considerable body of academic literature with a number of books[2] and even a dedicated academic journal[3] being published.

Yoram Dinstein's book, *War, aggression and self-defence*, now in its sixth edition, covers the 'older' and 'new wars' comprehensively and with aplomb. Dinstein, professor emeritus of Tel Aviv University, is a noted expert on the *jus ad bellum*, the *jus in bello* (the law related to the conduct of hostilities) and related topics, with a number of books and academic articles to his credit. This work is a focused, analytical and in-depth examination of the scope and content of the *jus ad bellum*, without venturing into related matters, such as the law of peacekeeping or disarmament and arms control.

The book is organised into three parts. Part I focuses on the legal nature of war. Chapter 1 deals with the definition of war, the territory of war (including outer space and the high seas) and the principles applicable to the law of neutrality. Chapter 2 titled 'The

course of war', explores how and when wars and hostilities are started and terminated: cease-fires, armistices and peace agreements.

Part II is titled 'The illegality of war'. The first chapter provides a historical overview of the just war theory, which aims to provide a legal basis for war when certain conditions are present. The development of this theory is traced back to its origins in Roman law, through the influence on it by Christian theology (notably by the philosopher-priest St Thomas Aquinas) and to the contributions by the Spanish monk Vitoria and the Dutch lawyer Grotius, who laid the foundations of international law in the sixteenth and seventeenth centuries, as the modern state system developed after the conclusion of the Peace of Westphalia in 1648. More recent expositions of the just war theory are Kelsen's proposition that war is legal in response to a prior illegal act, and the somewhat contested theories regarding the legality of wars of national liberation and of the doctrine of humanitarian intervention (the latter being correctly interpreted narrowly, to exclude unilateral interventions). The chapter then proceeds to report on the first attempts to limit the recourse to armed force in treaty law, the Hague Conventions of 1899 and 1907, and the Covenant of the League of Nations.

The next chapter focuses on contemporary treaty-based prohibitions on the use of inter-state force. It is contended that the 1928 General Treaty for Renunciation of War as an instrument of national policy (the so-called 'Kellogg–Briand Pact') marks the point in history where the *jus ad bellum* progressed to the *jus contra bellum*. The *jus contra bellum* was confirmed as a peremptory norm of international law by the prohibition of the use or threat of inter-state force in Article 2(4) of the United Nations (UN) Charter of 1945, which has since developed into a norm of not only treaty, but also customary international law, therefore being binding upon all states. The chapter concludes with an overview of the responsibility of states resulting from the unlawful use of force, including with respect to the obligation to provide compensation and individual criminal liability. The last part of the chapter reports on the legal limits of intervention with the consent of the government of a state, briefly referring to consent-based treaties in the Economic Community of West African States (ECOWAS) and African Union contexts, concluding that treaty-based consent will remain subordinate to UN law.

Unlike some of the other works on the subject and in line with its title, Chapter 5 of the book discusses the crime of aggression in considerable detail. It traces the historical development of this crime since the inclusion of the principle of individual criminal liability for waging aggressive war in the Treaty of Versailles (1919), through the Nuremberg International Military Tribunal (1946) to the Rome Statute of the International Criminal Court (2000). At the same time, it provides an overview of the process of defining the crime, analysing the somewhat problematic nature of the definition as well as the conditions for the exercise of jurisdiction. This is followed by the conditions applicable to individual criminal liability and immunities from jurisdiction. With respect to head of state immunity, the book has unfortunately been published before the decision by the Appeals Chamber of the International Criminal Court (ICC) in the *Jordan case*,[4] holding that heads of state do not enjoy immunities from the jurisdiction of the ICC. This section is concluded by a short chapter on the

effects the illegal use of force may have on the application of the *jus in bello,* the neutrality principle and territorial changes resulting from the illegal use of force.

Part III deals with exceptions to the prohibition of the use of force. The first chapter in Part III reflects an analysis of the right to self-defence in response to the occurrence of an armed attack, as provided for in Article 51 of the UN Charter, confirming that such a right existed in customary international law before the adoption of the Charter. The relationship between the concept of 'armed attack' and the prohibition of the 'use of force' in international relations provided for in Article 2(4) of the Charter, is then explored, after which the chapter proceeds to provide an excellent overview of the various discourses relating to the occurrence of and response to an armed attack, notably –

- the controversial doctrine of pre-emptive self-defence;
- the conditions for the existence of an armed attack (invoking the right to self-defence);
- the right to self-defence in response to an armed attack by non-state actors post 9/11; and
- the conditions required for action taken in self-defence: necessity, proportionality and immediacy.

How and under which conditions a state may react in self-defence, are discussed in the next chapter of Part III. The first part concentrates on measures available in case of an armed attack by a state, while the second explores measures available if such an attack is launched from the territory of another state by a non-state actor. As regards attacks from a state, the author distinguishes between measures short of war (armed reprisals where force is used, but which fall short of war) and war as a measure of self-defence, analysing the conditions of necessity, proportionality and immediacy as applicable in both cases. The chapter concludes with a discussion on the legal principles and state practice applicable to self-defence by a state against armed groups attacking it from the territory of another state.
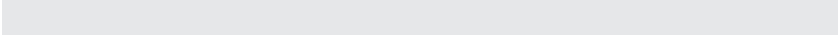
The author then proceeds to collective self-defence and collective security. As the International Court of Justice found in the *Nicaragua case,*[5] the right to collective self-defence emanates not only from Article 51 of the UN Charter, but also from customary international law. However, the contours of this right are not very clear, and in Chapter 9 the author organises this right into four categories of collective self-defence available to states (namely the right to individual self-defence being exercised individually or collectively, the right to collective self-defence being exercised by states on an individual basis, or by states acting collectively), and the legal authority provided for in Article 52(1) of the UN Charter for collective self-defence based on treaties or the mandates of regional organisations. The chapter concludes with an analysis of the exercise of collective self-defence by the international community on the basis of the UN Charter in the case of the first Gulf war of 1991–1992.

The concluding chapter deals with collective security arrangements, which could serve as a legal basis for the use of force when exercised in pursuance of the mandate of an international organisation. The right to decide to use force is therefore not granted to every single state, but only to an organ of the international community. The concept has its roots in the League of Nations, and forms the cornerstone of the United Nations, with the Security Council being mandated in the Charter to authorise the use of force in case of a threat to or breach of the peace or an act of aggression.

A discussion of the scope of the Security Council's powers and its decision-making process is followed by an overview of cases in which these powers have been exercised, as well as the relationship of the Council to NATO, specifically focusing on the legality of the NATO military intervention in Kosovo in 1999 without Security Council authorisation. The competence of the UN General Assembly in matters pertaining to international peace and security where the collective use of force may be exercised, is interpreted – in this reviewer's view correctly – as being limited to non-binding recommendations. The chapter concludes with an analysis of the relationship between the Security Council and the International Court of Justice, both UN organs, in cases where their separate but complementary functions may be exercised with respect to the same event.

While this book has considerable academic merit, it does not have theoretical pretensions. Its strong point is its clarity and accessibility and its focus on the needs of practitioners, both military and non-military. The diplomat serving her or his country at the United Nations, the planners of a military operation or the instructor at a military academy will all derive equal benefit from it. Dinstein's interpretation of the law on the use of armed force is narrow and non-speculative; it is left to other commentators in the field to push the boundaries outwards by means of theories aimed at extending the legal limits of the use of force. The sources referred to in the work are embedded in the *lex lata*, the law as it is: treaties, the practice of states, case law of both domestic courts and international courts and tribunals, and resolutions of the UN Security Council, while not neglecting the considerable academic contribution being made to this field. This book remains a work of solid and authoritative scholarship.

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ENDNOTES

[1] See C Chinkin & M Kaldor. *International law and new wars.* Cambridge: Cambridge University Press, 2017.

[2] Notably C Gray. *International law and the use of force.* Oxford: Oxford University Press, 2018; C Henderson. *The use of force and international law.* Cambridge: Cambridge University Press, 2018; R Cryer & C Henderson (eds). *Law on the use of force and armed conflict.* Cheltenham: Edward Elgar, 2017; M Weller (ed). *The Oxford handbook on the use of force in international law.* Oxford: Oxford University Press, 2015.

[3] *Journal on the Use of Force and International Law.*

[4] *Situation in Darfur, Sudan. In the case of the Prosecutor v. Omar Hassan Ahmad Al Bashir,* No. ICC-02/05-01/09 OA2.

[5] *Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States)* 1986 ICJ Reports 14.

Book Review

SOUTH AFRICA'S POST-APARTHEID MILITARY: LOST IN TRANSITION AND TRANSFORMATION

Lindy Heinecken

Craig Bailie
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The South African National Defence Force (SANDF) recently celebrated, "25 Years of Defence in Democracy"[1]. Professor Lindy Heinecken's latest book, *South Africa's post-apartheid military: Lost in transition and transformation*, is therefore a timely work. Published 25 years after South Africa's first democratic elections and the integration of the country's disparate armed forces, Heinecken gives a well-researched, fair and comprehensive account of the critical issues that have characterised 25 years of defence in South Africa.

More importantly, South Africa's 2015 Defence Review states that the South African Defence Force "is in a critical state of decline"[2]. This decline has continued unabated in the five years since. Heinecken writes, "[t]he SANDF is without a doubt at a cross roads."[3]

Any action taken to turn the tide on the decline of the SANDF must be founded on knowledge and understanding of the challenges confronting defence transformation in South Africa. Throughout her book, Heinecken provides us with the necessary foundation to do just that.

The decline of the SANDF is significant because a democratic society and its armed forces are inextricably linked. On the one hand, a democracy is reliant upon defence against aggression from outside (and increasingly in the post-Cold War era, from within). One commentator[4] recently argued that South Africa's, "continued and successful existence as a robust democracy and economic powerhouse is intricately dependent on the SANDF". He continued, "democracy will not defend SA, but democracy has to

be defended by a well-resourced and funded SANDF". On the other hand, democracy relies on the appropriate control of the military power in the country, thereby regulating the potential for the military to "wreck the fabric of society".[5] In its extreme, military action of this nature takes the form of a military coup.

Concerns expressed over defence in the South African democracy have not involved the risk of a military coup. Rather, these concerns have centred on whether those responsible for exercising leadership in the area of defence have enabled the establishment and sustainability of two things: a capable defence force and a civil–military culture that reflects and reinforces democratic principles.

Since the publication of the 2015 Defence Review, commentaries on defence in the South African democracy have largely taken the form of short, albeit valuable, online pieces. Some research findings have been published in academic journals. Book chapters that deserve mention are those authored by Lindy Heinecken (*Reflections on insider-outsider experiences of military research in South Africa*, 2016),[6] Theo Neethling (*The dilemma relating to the modernisation of the SANDF and its external role*, 2019)[7] and Jo-Ansie Van Wyk (*The executive and the military in South Africa during the Zuma presidency*, 2019).[8] Interestingly, each of these authors has spent some time as academics at the Stellenbosch University's Faculty of Military Science, housed at the South African Military Academy.

A relatively small number of individuals have the qualification, experience and insight required to make a meaningful contribution to research on South African military affairs. Additionally, and for reasons that Heinecken outlines in Chapter 4 of her book, interest in researching South Africa's military affairs has waned. Research in this field however remains to be of vital importance – in the building of healthy civil–military relations, in consolidating South Africa's democracy, and in assessing the support that the military instrument can offer the state as the latter pursues its regional and continental endeavours.

The need to know what the military can offer as far as South Africa's foreign policy is concerned, gains impetus to the extent that government aspires to play a continued role in cultivating peace and security in the African continent. This, while – at the same time – making use of its membership of international forums, such as the South African Development Community, the African Union, and the United Nations Security Council.

Professor Heinecken is undoubtedly among the few that are qualified to speak about these spheres of South Africa's democratic and national interest. The author holds a PhD from the King's College London Department of War Studies. She is a former researcher and Deputy Director of the Centre for Military Studies (CEMIS) at the South African Military Academy, and she continues to serve as a specialist researcher for the South African Army. Her book is the culmination of thirty years of research on the relationship between armed forces and society.

In the work under review, Heinecken aims to "straddle theory and practice", "capture the 'lived experiences' of soldiers" and "critically reflect on the challenges of

defence transformation, and to point out lessons learnt".[9] The significance of 'defence in a democracy' underlines the importance of these three tasks.

Defence transformation refers to how the military undergoes the necessary changes following the transition to a "new political dispensation and changed security context".[10] The analysis of any practice or process – in this case, defence transformation – must happen against the appropriate theoretical background. Heinecken does this, but according to the reviewer, without giving the theory of civil–military relations the necessary priority.

The essential concern that characterises the theory of civil–military relations is how best to exercise civil control of the military. In a democracy, civil control must take the form of democratic control. It is the theory of civil–military relations that allows for an understanding of why South Africa's civil–military relations under apartheid were problematic and why there existed a need for defence transformation with the advent of South Africa's democracy.

Defence transformation therefore falls within the wider ambit of civil–military relations. The defence transformation challenges that Heinecken brings to the attention of the reader originate largely from within the interrelationship of "the military, political decision-makers and the host society".[11] Even where challenges originate from outside the civil–military relationship (a new international security environment, for example), successful management and/or resolution of these challenges depends on the quality of a country's civil–military relations. The defence transformation challenges that Heinecken cites are significant to the extent that they inhibit the capacity of the military to fulfil its function and the realisation of the norms that govern defence in a democracy. These challenges can only be recognised, measured, deliberated, understood and solved with theoretical principles in mind.

The author could have extended her writing on the theories of civil–military relations in Chapter 4 to make for an entire chapter on theory at the beginning of the book. Such an extension could also have included more detail on the notion and practice of security sector reform that characterised other countries, who, like South Africa, were transitioning from intrastate conflict and/or non-democratic governance in the immediate post-Cold War era. The historical overview of South Africa's political transition and defence transformation, as important as it is, will then have taken second place in the chapter line-up.

For Heinecken, the challenges that have confronted defence transformation in South Africa originate from the three new environments that emanated from the end of the Cold War and the country's transition from apartheid to democracy. These are a new security environment, a new political environment and a new social and legal environment. These new environments provide the historical-contextual framework for Heinecken's analysis of defence transformation in post-apartheid South Africa. Using David Chuter's conceptualisation of defence transformation, Heinecken considers how South Africa's post-apartheid military has adapted to the country's new environments while undergoing the consequential organisational, political, cultural and human resource transformation.

The ability of the SANDF to adapt to each new environment is assessed in Heinecken's coverage of key issues that have characterised the transformation of South Africa's post-apartheid military. These key issues are reflected in the choice of chapter titles. Heinecken's examination of each issue reveals the extent to which the pursuit of defence transformation has served to either erode or reinforce South Africa's military capability and the norms that govern 'defence in a democracy'. The title of her book is instructive in this regard, as it embodies the essence of her findings.

The processes of democratic transition and military transformation have placed the SANDF on a less than desirable trajectory. This has happened to the point where, if the defence force is to achieve the capability necessary for the fulfilment of its constitutional mandate, it must be 'found' again.

Heinecken not only focuses on South Africa's defence force, however. The author takes a sociological approach, relating her account of the transformational challenges facing South Africa's post-apartheid military to the wider South African society. There is good reason why Jakkie Cilliers, in the foreword to the book, describes Heinecken as, "the ultimate empathetic social scientist".[12]

In her analysis of the SANDF's capacity for effective involvement in peace missions, for example, Heinecken expresses sincere concern over, and does well to capture through interviews, what she refers to as, "the 'lived experiences' of soldiers".[13] Her concern extends beyond the soldier, to the consequences of these experiences for the military family during and after post-deployment integration.

Heinecken acknowledges that there are aspects of South Africa's defence transformation not included in her volume, but that are important nevertheless. She cites "foreign policy, defence strategy and policy, the armaments industry and professional military education" as examples.[14] These are aspects located beyond the purview of her 30-year-long inquiry into the relationship between armed forces and society. Even with a restricted scope, one would have expected a larger, more in-depth volume from a scholar with Heinecken's experience. However, as the author herself explains, the book is aimed at a wide audience.[15] The length of the book is a deliberate attempt at making knowledge of the challenges confronting defence in South Africa's democracy accessible. Growing awareness of these challenges will help bridge South Africa's ever-widening civil–military gap, "whereby fewer and fewer people are knowledgeable about military matters, consequently weakening civil control, oversight and accountability".[16]

In short, Heinecken's book offers the broadest and most comprehensive account that one will find of defence-related issues in South Africa's 25-year-long democratic journey. Military and political leaders will appreciate this work if their intention is to create and maintain a defence capability aligned with constitutional precepts and cultivate civil–military relations that meet with democratic norms. The current trajectory of South Africa's defence force and South Africa's wider civil–military relations must change. Reading Lindy Heinecken's book is an appropriate starting point.

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Book Review

PRISONERS OF GEOGRAPHY: TEN MAPS THAT TELL YOU EVERYTHING YOU NEED TO KNOW ABOUT GLOBAL POLITICS

Tim Marshall

Ivan Henrico

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Tim Marshall is an esteemed authority on foreign affairs, with more than thirty years' experience in broadcasting, reporting, analysis and writing about past, present and future geopolitical affairs – most of the time reporting from the front line on major world events and conflict zones that had significant geopolitical effects on global politics, such as the Balkan wars of the 1990s, the Kosovo crisis of 1999, the first Gulf War (1991), the US war in Afghanistan (2001). He also covered three US presidential elections (The What and The Why, 2016). *Prisoners of geography: Ten maps that tell you everything you need to know about global politics* is arguably the most successful of his books, and makes for an intriguing read by an author with such an impressive résumé.

The cover of the book is beautifully designed, drawing one's attention to the geopolitical word cloud spreading across Africa, Europe and Asia. This immediately creates a feeling of excitement to start reading this highly acclaimed book, with over 500 000 copies sold worldwide.

The book provides an excellent outline of contemporary geopolitical issues facing all the major regions of the globe, of which Russia, China, the United States, Western Europe, Africa, the Middle East, India and Pakistan, Korea and Japan, Latin America and the Arctic are discussed. The author argues that global socioeconomic development, political ideologies and international affairs are shaped by the features of the physical landscape and geographical factors (e.g. demographics, availability of natural resources and climate) that characterise these 10 regions. A chapter is dedicated to each region, which comprehensively describes the geospatial location and geographical characteristics that influence the attack and defence strategies of each region. Each chapter is prefaced by a political map of the region for orientation purposes, and shows boundaries, major

cities and prominent features. Additionally, 10 smaller maps are presented, which are more focused and orientated, and which enjoy more explanation by the author as key areas of past, present and possible future conflict zones. Even though these maps serve their purpose to orientate and provide reference to discussions, one let-down is that they are monotonous and lack diversity.

The author mentions that no one geographical feature is more important than the next (p. 2), but indirectly focuses on the influence of rivers, seas and mountains as important features that determine action. Rightly so, because all 10 regions discussed in the book are in some way or another affected by water bodies and mountains that influence international affairs. The author discusses each region by focusing on both internal and external matters. Aspects such as population distribution, ethnic and religious rivalries, international trade and relationships, national and international politics, access to natural resources, conflicts and the search for power (supremacy) are described. In these discussions, the focus falls on past, present and future trends and how the shape of the land (i.e. its geographical characteristics) influences and dictates the actions in a region. This review highlights a broad description of four superpowers (Russia, China, the United States and Western Europe), which the author identifies and discusses in this book. The other six regions are only briefly cited.

The author highlights that Russia is surrounded mostly by mountains and sea and its most vulnerable point of attack is across the North European Plain, which is where the focus of Russia lies. The size of Russia provides it with a geographical advantage that the author calls 'strategic depth', meaning that opposing forces need long and sustainable supply lines to attack from the west. It is stated that this has never happened successfully. Conversely, Marshall notes that Russia will never be a global superpower, because of its geographical location. As he states, "[t]he bars of Russia's geographical prison … are still in place" (p. 79). Arguments are made that Russia's quest for warm water open sea-lanes in the south, which has still not been achieved, is the main reason for shaping their global policies and their continuous conflict with Ukraine. Mention is made that in future, Russia will use the concept of "ethnic Russia" (p. 18), which describes its population in territories outside the Russian borders, and its energy resources (i.e. oil and gas) to justify potential international influences and actions.

It was interesting to note the notion that like Russia, China selected the territorial defence strategy of "attack as defence" (p. 38), because it covers a vast territory, which is protected by the Pacific Ocean to the east and south, the Himalayas to the west and the Gobi Desert to the north. However, considering the fact that most of China's population is located within the heartland, known as the North China Plain, the defence strategy would be nullified with a massive offensive focused on this area. It is further stated that China has always made use of short sea routes for trade and therefore never required naval supremacy. However, the argument is put forward that this is changing. To patrol and occupy maritime borders effectively and ultimately control the South China Sea for the purpose of forcing the voyaging US Navy back to their territory, a strong navy will be needed. This move will evidently give them authority over their neighbours in terms of territorial control and access to resources.

Marshall claims the United States (US) is a superpower because of its location, and he comprehensively describes the advantages of the geography of this region. The main idea of this argument is that the United States is ideally located geographically and has the advantage of long coastlines with natural harbours, navigable waterways, interconnected river systems, fertile land, and access to rich natural resources. Why then the global involvement? The author states that the US global strategy is to establish and maintain an international geopolitical footprint to be the supreme economic and military power. Through global alliances, the United States has forces that are strategically placed around the globe to act and get involved in any foreign entanglement that would challenge its global domination. Mention is made that there are three such global powers, namely a united Europe, Russia and China, of which China is the most likely to overtake the United States as the leading superpower.

Much of the same geographical description followed in the previous chapters is presented in the chapter on Western Europe. The importance of Europe's climate, river networks, mountain ranges, open plains and fertile soil is mentioned. The author further states that Western Europe has one important disadvantage – disconnection through natural barriers. The lay of the land creates a lack of cohesion between countries that still act independently from one another by putting their own interests before the interests of the region. In the second half of this chapter, the author briefly describes the geography of France, Germany and the United Kingdom (UK). The relationship between France and Germany is highlighted, and the author states that this love–hate relationship created the gateway for establishing the European Union (EU). Marshall refers to the unique geographical situation of the United Kingdom – a secluded location – which has the advantage of selecting either to isolate itself from the mainland or to decide when to interact, which normally happens when its supremacy is challenges or at risk. No mention or reference is made by the author about the effect of Brexit on the supremacy of the United Kingdom in the European region or elsewhere in the world. An interesting consideration for future work would be whether the United Kingdom would maintain its superpower status with limited and restricted support by European countries.

Regarding the chapters on Africa and the Middle East, the main ideas highlighted are that isolation, exploitation of resources and people, and the delineation of artificial boundary lines by colonial powers, with no regard for the arrangement of physical features and cultures, are a formula for disaster. The consequences are ethical and cultural unrest, division between religious groups, and civil wars, which are limiting the development of these regions to be global economic role players.

The same theme about artificial boundaries on maps and conflict between countries is visible in the chapter on India and Pakistan. Geography placed these two opposing states together. Pakistan is fixated with what India does and why they are doing it. So, too, is India obsessed with Pakistan, but India is also an evolving economy and political role player, an emerging global power. This chapter describes the past, present and future rivalries between these two states, and refers to the involvement of China and the United States in the region.

Concerning Korea and Japan, not much reference is made to the geographical layout and characteristics that shape this region, as in the other chapters. Marshall creates a picture of uncertainty regarding the predictability of the tension that exists between North and South Korea. There is a troubled past between these two countries relating to territorial occupation disparities. The author notes that the geographical barriers of Japan caused it to militarise in the first half of the twentieth century. Consequently, Japan was punished by the Western world, which brought its economy and industrial development to its knees. However, a common enemy – Communist China – created the path for an alliance between the United States and Japan. Consequently, Japan is well on its way to rise to be a global powerhouse again.

The chapter on Latin America describes the barriers that location and geography create for international relations, internal cohesion and development. The influence of colonialism on the region, the relationship between the United States and Mexico, and the interests of China in the region are discussed.
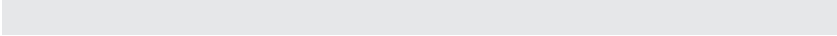
The last chapter, the Arctic, mentions that this almost uninhabitable place has never really been on the radar of most nations. The author states that this is changing and that the twenty-first century will see more disputes amongst countries over this region, because energy had been discovered. Russia is claiming parts of this region, but the United States, Canada, Norway and Denmark are opposing these claims. Marshall foresees a possible zone for future military conflict, or perhaps a communal territory with rich natural resources that will be shared by all – only time will tell.

Prisoners of geography: Ten maps that tell you everything you need to know about global politics by Tim Marshall is a fascinating read that combines historical and regional geography. It identifies key geopolitical issues facing the major global regions and comprehensively outlines past, present and possible future conflict zones. The book lacks an in-depth analysis of major conflict events of the past that shaped the world, as we know it today, but generally provides a good background to why geography plays such a defining role in international affairs. However, this simplicity makes the book easy to understand. The author makes mention of the role that modern technology plays to overcome geographical barriers, but only to a limited extent, and no mention is made of the role that nuclear weapons might play in the future to overcome geographical barriers. Nevertheless, the way that the author articulates geography as a major determinant that influences politics on a regional, national and global scale is quite brilliant. A very informative and easy-to-read book that is highly recommended to anyone who wants to understand the concept of geopolitics better – more specifically, the influence of geography on global affairs and how history has shaped the world as we know it today.

An illustrated version and explanatory text for children and teenagers alike, called *Prisoners of geography: Our world explained in 12 simple maps,* originated from this book. This latter book was published on 31 October 2019 (Geographical, 2019) and might be a good read to consider for educating the young about global geopolitics.

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ENDNOTES

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NOTES TO CONTRIBUTORS

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