

**The Nature of Public Participation in the
Decision to Implement Shale Gas Mining: A
Case Study of the Karoo Basin**

Written by

Kofi Gyan Quartey

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Abstract

Since 2008 the African National Congress has been making preparations to legalise Shale Gas Mining in South Africa. Shale Gas Mining and its single process of unconventional oil/gas extraction called fracking, has sparked immense controversy both locally and internationally. This has made fracking and Shale Gas Mining a highly politicised topic. Due to uncertainties of the sustainability of fracking, which is evident in factors such as the lack of scientific evidence, and public opposition, states such as France and Bulgaria, have banned fracking. Currently the USA, Canada, Argentina and China are the four major countries in the world that are fracking for unconventional shale gas and oil at commercial levels. Opponents of fracking and SGM emphasise its long term negative socio-economic and environmental consequences. Proponents of fracking and SGM promote it on the basis that it harnesses the potential to bring economic growth and energy security. Further exacerbating the contentious nature of the fracking debate is the lack of accountability, transparency and good governance regarding its proposed implementation around the world including South Africa. The South African Constitution affords all its citizens the right to participate in political decision-making. This research interrogates the nature of public participation in the African National Congresses decision to legalise Shale Gas Mining in the iconic landscape of the Karoo basin. This research employs desktop study aided by 90 journal articles, 40 electronic pdf documents, 71 websites, 19 books, 6 online videos comprised of fracking documentaries news reports, 4 government publications and 2 conference papers. Findings from this study reveal a prevalent lack of transparency and a lack of genuine public consultation and public involvement by South Africa's national government regarding the proposed implementation of shale gas mining and fracking. Although public consultations had been conducted by Shell falcon and Bundu as is required by the National Environmental Management Act, October 2014 saw the first public consultations initiated by the South African government – over five years after fracking was proposed.

DECLARATION

Submitted in fulfilment of the requirements for the degree of
....., in the Graduate Programme in,
University of KwaZulu-Natal, Pietermaritzburg, South Africa.

I,, declare that

1. The research reported in this thesis, except where otherwise indicated, is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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 - a. Their words have been re-written but the general information attributed to them has been referenced
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Student Name

Date

Name of Supervisor

Signature

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List of Abbreviations

ANC	African National Congress
API	American Petroleum Institute
AQA	Air Quality Act
ASALGP	Australian South African Local Government Partnership
CCGT	Combined-Cycle Gas Turbine
CEO	Chief Executive Officer
CER	Centre For Environmental Rights
CH ₄	Methane
CO ₂	Carbon dioxide
CONNEPP	Consultative National Environmental Policy Process
COP	Conference of Parties
CPUT	Cape Peninsula University of Technology
CSIR	Centre for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMP's	Environmental Management Plan
GHGs	Greenhouse Gases
IAPs	Interested and Affected Parties
IPCC	Intergovernmental Panel on Climate Change
IOC	International Oil Companies
LCA	Life cycle Assessments
LTMS	Long Term Mitigation Scenarios
MDGs	Millennium development Goals
MPRDA	Mineral and Petroleum Resource Development Act
MPs	Ministers of Parliament
NEMA	National Environmental Management Act
NDP	National Development Plan
NGO	Non Governmental Organisation

NPC	National Planning Commission
NWA	National Water Act
PA	Pennsylvania
PASA	Petroleum Agency of South Africa
PSC	Public Service Commission
PADEP	Pennsylvania Department of Environmental Protection
RETs	Renewable Energy Technologies
RDP	Reconstruction and Development Programme
SANBI	South Africa National Biodiversity Institute
SEA	Strategic Environmental Assessment
SGM	Shale Gas Mining
SGE	Shale Gas Exploration
SGEIS	Supplemental Generic Environmental Impact Statement
SKA	Square Kilometre Array
TCF	Trillion Cubic Feet
TKAG	Treasure the Karoo Action Group
UKZN	University of KwaZulu Natal
US EIA	United States Environmental
USA	United States of America
WESSA	Wildlife Environmental Society of South Africa
WWF	World Wildlife Fund
UNFCCC	United Nations Framework Convention on Climate Change

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CHAPTER 1: INTRODUCTION

1.0 Background & outline of research problem

With the world currently facing an energy crisis, a critical need has risen for states to diversify their energy resources (Coyle & Simmons, 2014; Li, 2007). The main reason that the energy crisis has emerged is due to the increase in energy demands at national and global levels (Coyle & Simmons, 2014). Since the dawn of the industrial revolution till today, states around the world continue to consume enormous quantities of fossil fuel energy resources such as coal, oil and gas. It is on fossil fuels that most states are dependent for meeting their national energy demands (Coyle & Simmons, 2014; Sthel, Tostes & Tavares, 2013). As a result, fossil fuels are heavily extracted and consumed to the detriment of the natural environment, and to the detriment of human health (Haines et al., 2014; Thurston & Bell, 2013). The use of fossil fuels is the cause of resource depletion and increases in greenhouse gas emissions, which many experts believe is responsible for global warming – an increase in average global temperatures (Coyle & Simmons 2014; Davis & Shearer, 2014). Although the impacts of intensive and excessive combustion of fossil fuels remains prevalent, it cannot be denied that the electricity that is obtained from fossil fuels serves as the crucial mechanism for poverty alleviation (Times Live, 2010). According to the World Bank there can be no poverty reduction without electricity (Times Live, 2010). With the world population rising past the seven billion mark, it has been predicted that global energy consumption is expected to increase by thirty six percent between the year 2011 and the year 2030 (Coyle & Simmons, 2014; BP Energy Outlook 2030, 2013). Amidst the global energy crisis, it is evident that underdeveloped states will remain the most affected. Many countries in sub Saharan Africa have insufficient production capacity to meet their rapidly rising demand for electricity (Kessides, 2014). These shortages in electricity supply have become a major constraint on Sub Saharan Africa's progressive socio-economic development (Kessides, 2014).

In the wake of this global energy crisis, unconventional shale gas and oil is being promoted by the oil and gas extraction industry as the solution; a bridging fuel that

could aid in meeting national energy demands until a significant transition to renewable energy technologies (RETs) has been attained (Levi, 2013; Cathie's et al., 2012; Cooley et al., 2012; Howarth, Santoro & Ingraffea, 2011). RETs include solar energy, wind energy, biogas, biomass and hydropower (Walwyn & Brent, 2015). Unconventional oil and shale gas resources are additionally promoted as the strategic step for states in both developed and underdeveloped regions, as a means to attain national energy security and energy independence (Franco, Martinez & Feodoroff, 2013; Nye 2012). The widespread development of unconventional natural gas in the USA and other states such as Canada, Argentina, Poland and China has been made possible by technological advances, economic incentives, and the ever-increasing demand for alternative energy sources (Forbis & Kear, 2011). The combination of hydraulic fracturing (fracking) and horizontal drilling are the technological advances that have made unconventional oil and shale gas resources easily accessible (Cooley et al., 2012; API, 2013). Although hydraulic fracturing and horizontal drilling were initially developed in the mid to late 1940's they were not commercialised until the twentieth century (Cooley et al., 2012 Brantley & Meyendorff 2013; Finewood & Stroup, 2012; Vidic et al., 2013).

1.1 What are unconventional shale gas and oil?

Shale gas is a fossil fuel that is generated from organic rich shale rocks (Kotze, 2013). The reason that the extraction industry and governments express much interest in shale gas is that it contains methane (CH₄). Methane is a greenhouse gas (GHG), which is useful for producing fuels or generating electricity (Kotze, 2013). As compared to conventional gas resources, unconventional shale gas is more complicated to extract than conventional natural gas. This is because unconventional shale gas/oil require the process of fracking in order to be extracted.

1.2 What is Fracking?

Fracking, also known as hydraulic fracturing, is the process of drilling into the earth at depths of four to five kilometres to reach rock formations where unconventional oil or natural gas reserves exist (Dong 2015; Mitka, 2012; Howarth, Santoro & Ingraffea, 2011). When the drilling phase of the fracking process is complete, a blend of large volumes of water, sand and a mixture of various chemicals are then injected into shale

rocks at very high pressures (Dong 2015; Howarth, Santoro & Ingraffea, 2011). The pumping of water into the rocks is what causes the rocks to fracture. Fracturing the rocks releases the natural gas, which flows up to the surface of the hole where it is captured (Mitka, 2012). Recent developments in this new technology now allow creating a bore hole and then drilling into the shale horizontally, releasing greater amounts of natural gas from each well (Mitka, 2012). It is this latter process that is referred to as horizontal drilling (Mitka, 2012).

1.3 Why unconventional Shale gas?

Hydraulic fracturing and horizontal drilling changed the energy outlook of the USA. In 2001 shale gas made up only one percent of USA gas supply (Kerr, 2010). From 2005 to 2010 the shale-gas industry in the USA grew by forty five per cent annually, and the share of shale gas in the US' overall gas production grew from four per cent to twenty four percent (Forbis & Kear, 2011).

1.4 What is energy independence?

Energy independence is defined by former American President Nixon as a situation in which domestic energy production becomes sufficient to “meet our own energy needs without depending on any foreign sources” (Morris, Nivola, & Schultze, 2012; Yergin, 2006). When a state attains energy independence, imports of energy sources from other states are no longer necessary. It may occur that the independence may cause the state that has achieved it to export to other states if domestic energy supplies are in excess. Energy independence can also be referred to as energy self-sufficiency.

1.5 What is energy Security?

According to Pascual & Elkind (2010) energy security is made up of four key elements: availability, reliability, affordability and sustainability. (1) Availability refers to the consumers and users ability to securely access energy in proportion to their needs. (2) Reliability refers to the extent that energy services are shielded from disruption. (3) Affordability of energy involves low or equitable prices relative to income and stable prices. (4) Sustainability refers to minimizing the social,

environmental, and economic damage that may result from long-lived energy infrastructure (Pascual & Elkind, 2010).

1.6 Shale Gas Production around the globe

Shale gas extraction and production however, is not confined to the USA. Countries in the world that are currently producing shale gas at commercial level are Canada, China and Argentina (EIA.gov, 2015). Currently there are forty-eight global shale gas basins in thirty-two countries contain almost seventy formations of shale with vast amounts of unconventional oil and shale gas reserves (US EIA, 2013). These forty-eight shale gas basins have more than five thousand seven hundred and six trillion cubic feet of recoverable shale gas deposits (US EIA, 2013). In Europe: France, Germany, Netherlands Norway, United Kingdom, Denmark, Sweden, Poland, Turkey, Ukraine, and Lithuania. In Asia: China, Pakistan, India and Pakistan. In Asia: China, India and Pakistan (US EIA, 2013). In South America, Venezuela, Columbia and Argentina, Brazil, Chile, Uruguay and Paraguay and Bolivia. The continent of Australia also holds significant amount of recoverable shale gas reserves (US EIA, 2013). In Africa: Libya, Tunisia, Algeria, Morocco, Western Sahara and Mauritania and South Africa. In Africa Algeria and South Africa possess the two largest shale gas reserves (Franco, 2013).

1.7 Controversies Surrounding Fracking

The promotion of unconventional sources of oil and natural gas in the USA and in other states in which it is practiced and awaiting implementation, has generated a great amount of controversy and public opposition (Boudet et al., 2013; Mazur, 2014). Opponents, i.e. those against hydraulic fracturing, have described it as a violent extraction method hazardous to public health and the environment (Beyond Natural Gas, 2015; Howarth, Santoro & Ingraffea, 2011). Opponents of unconventional SGM want fracking banned (Howarth, Santoro & Ingraffea, 2011). The opposition to fracking arises out of concerns that stem from documented cases of earthquakes, community displacement, air pollution, erosion of human rights and the rule of law (Howarth, Santoro Ingraffea, 2011). Opponents of shale gas consist of local residents and environmentalists, some of whom have first hand experience on human

induced earthquakes and low earth tremors, and other environmental impacts that have resulted from fracking (Ellsworth, 2013; Merrill, 2012).

In spite of the perceived detrimental impacts of fracking, and fierce local opposition, some democratic governments are still considering possibilities of fracking for shale gas. Currently a few states are undertaking explorations, evaluation drilling, pilot project drilling and pilot production testing (Franco, 2013). Governments from these nation states are looking to duplicate the same economic benefits that the USA accrued from unconventional shale gas and oil extraction. These countries include Poland, Sweden, Denmark, United Kingdom, Netherlands, Ukraine, Italy, China, India, Taiwan, Vietnam, Argentina, Mexico, Columbia and Brazil, Algeria and South Africa (Franco, 2013).

1.8 Global Mobilisation Against Fracking

The lack of public participation regarding proposed unconventional SGM ventures has resulted in the mobilisation of people, communities and non-governmental organisations against decisions to implement fracking (Mercardo, Álvarez and Herranz, 2014). One such major movement is global frackdown day, an international day of action that was initiated by Food & Water Watch. The mandate of global frackdown is to ban fracking initiatives worldwide (Franco, Martinez & Feodorf, 2013).

1.9 Fracking Bans across the World

There are a few countries in the world that have banned fracking. In 2011 France became the first European state to officially ban fracking (Good, 2015; Weile, 2014). President Sarkozy stated that France would maintain the ban on fracking until there is proof that shale gas would not harm the environment or the landscape (Good, 2015; Hedden et al., 2013). Bulgaria became the second European state to ban fracking and revoked a shale gas permit that it had initially granted to Chevron (Good, 2015). Germany became the Third country to ban fracking (Good, 2015). Germany first enacted the ban on fracking in 2012, and upheld the ban in 2014. The German Environmental Minister, Barbara Hendriks stated that if it could be proven that fracking did not pose any harm, it would no longer be permanently forbidden in

Germany (Good, 2015). Scotland became the fourth country in Europe to ban fracking in January 2015 (Brooks, 2015; Good, 2015). The Scottish Government stated that they wanted to conduct public health and environmental assessments of fracking before any decisions were made (Brooks, 2015; Good, 2015). Across these four countries the public opposition against the implementation of fracking coupled with scientific evidence contributed to the ban on fracking.

1.10 Local Mobilisation Against Fracking in South Africa

In South Africa the interest to pursue unconventional SGM began in 2008 with a focus being mainly on the Karoo basin (Netshishivhe, 2014). In South Africa, initial public opposition against fracking caused the national government to institute a moratorium on fracking. However, having initially placed the moratorium on fracturing in February 2011 for eighteen months, South Africa became the first country in the world to reverse a moratorium on SGE (shale gas explorations) in September 2013 (Franco et al., 2013; Hedden et al., 2013). SGE are to be conducted in the iconic landscapes of the untouched Karoo Basin.

Representatives such as the Treasure the Karoo Action Group (TKAG), AfriForum, Centre for Environmental Rights (CER), World Wildlife Fund Wildlife Environmental Society of South Africa (WESSA), have opposed fracking in its current form. These organisations have taken a stand against the lack of accountability and transparency by the National government in protection of both the present Karoo community, future posterity, their livelihoods, their natural environment, and their human rights (Temper et al., 2013). These organisations have created awareness campaigns and have been educating the South African public through workshops, social media, and music. Their awareness campaigns communicate what fracking is, what the process entails, and the impacts that it could have on the public and their environment (Temper et al., 2013). Many Karoo farmers and other Karoo community members have been empowered to join the fight against fracking. As a result, many protests and demonstrations have been held against the implementation of fracking in the Karoo (Bond, 2015; Sutherland, 2013).

1.11 Origin & History of Public Participation

Public participation is the cornerstone of democracy. The model of decision-making by means of public participation dates back to the time of Greek city-states where participation by all citizens in decision-making was a mandatory (Rhodes 2007). In Greek city-states all citizens regardless of their socio-economic status were involved in decision-making processes. All men without an arbitrator, judge, elected or appointed official took part in influencing the course of public decisions (Forje, 1999). In Greek city-states however, both women and children were not regarded as citizens, and were therefore excluded from partaking in decision-making processes.

1.12 Public Participation in South Africa

The nature of South Africa under the Apartheid regime was characterized by the suppression of public participation amongst certain races by law (Nyati, 2010). Decision-making was thus structured to advance racial segregation and exclusion of Black Africans coloureds and Indians who formed the majority of the South African population (Nyalunga, 2006). The history of the rise of public participation in South Africa has its roots in the freedom charter, officially adopted by the congress of the people (COP) in (Kgositsile, 1986; Turok, 2014). The Freedom Charter was a core principle of the Congress Alliance, which was made up of the ANC and its coalitions. The freedom charter is characterized by its opening demanded “ The people shall govern!” Under this a principle, which states that all people, shall be entitled to take part in the administration of the country (Kgositile, 1986). The Freedom Charter is the statement of core principles of the South African Congress Alliance, which consisted of the African National Congress and its allies, the South African Indian Congress, the South African Congress of Democrats and the Coloured People's Congress. It is this principle of the people shall govern that South Africa’s constitutional democracy as one that is representative and participatory in nature (Nyati, 2010). The representative aspect of the Constitution of the Republic of South Africa embraces a multi-party democracy achieved through regular elections based on a common voters roll and proportional representation (Nyati, 2010). The participatory aspect of South Africa’s democracy directly affords citizens the right to participate in all aspects of political life. The democratic government of South Africa, the ANC acknowledges

public participation and also emphasize on the importance of public involvement in decision-making. With the election of the post-apartheid government, 1994 public participation became a constitutional imperative. Under the new south Africa it is required that the needs of the public are to be responded to, and public participation is to be encouraged amongst citizens by national and local government so that citizens partake in policy making (Public Service Commission, 2008: V).

1.13 The Constitution of The Republic of South Africa and Public Participation Rights

The Constitution of the Republic of South is one of the most progressive Constitutions in the world and as a result enjoys a high level of commendation worldwide (Mates, 2012). Sections 59, 72 and 118 and 195 of the Constitution further mandate both the national and provincial levels of government to facilitate public participation.

1.14 The Public Protector

Apart from the constitution of the republic of South Africa, various institutions have been established to protect South African citizens from unconstitutional human rights violations. The office of the Public Protector was established in line with South Africa's Constitution to investigate complaints against government agencies or officials and state owned companies.

1.15 National Environmental Management Act (NEMA) 1998

NEMA provides for co-operative environmental governance by establishing principles for decision-making on development projects that could affect the environment. The National environmental management Act 1998 compels decision-makers to ensure that they conduct transparent decision-making, ensure access to information, uphold sustainable development, and also prevent unfair discrimination in the decision-making processes.

1.16 The Constitution of the Republic of South Africa, Human & Environmental Rights

The constitution of the republic of South Africa acknowledges the right of its citizens to a non-hazardous environment. Section 24 (a) of South Africa's Bill of rights of the Constitution (1996) states that "Everyone has the right to an environment that is not harmful to their health or well-being". Moreover, Section 24 (b) of the Bill of rights (1996) states ... "and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure sound ecological sustainable development and use of natural resources while promoting justifiable economic and social development" (Constitution of the Republic of South Africa, 1996 : 6).

1.17 Public Participation Defined & Theorised

Public participation is a mechanism for establishing democracy and promoting social cohesion between government and their citizens, particularly in the provision of quality and sustainable services (Public Service Commission, 2008). Parry, Mosley and Day (1992: 16) define public participation as members the public coming together and 'taking part in any of the processes of formulation, passage and implementation of public policies'. Public participation according to Arnstein (1969) is defined as "the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future". Public participation gives the opportunity for socio-economically disadvantaged people to engage in significant social change that qualifies them to share the benefits that the members of the affluent society have (Arnstein, 1969). Public participation is to be undertaken in such a manner that the outcome of the process is defined by the opportunity that is presented to citizens to negotiate and engage in trade-offs with their governments (Arnstein, 1969).

Choguill (1996) states that community participation or community participation is not only a means to enable the people to get through mutual help initiatives that provide them with basic needs, but a means for the people involved to influence decisions in the political arena about issues that affect them (Choguill, 1996). Public participation

therefore, exists as a mechanism to address any issues and grievances of IAPs regarding the implementation of any development project. Public participation also allows for the communication of information to the public from decision makers regarding the details of any development project or activity that may affect them. Thus public participation remains a democratic model through which democratic governments can allow for the inclusion of different stakeholders in decision-making processes.

The Public Participation Guidelines for Stakeholders in the Mining Industry First Edition (2002) defines stakeholders or Interested and Affected parties (IAPs) as “ individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences” (p.1). Moreover according to The Public Participation Guidelines for Stakeholders in the Mining Industry First Edition (2002) the term “Stakeholders” is inclusive of local communities, investors, business associations, trade unions, customers, consumers, farmers, residents, environmental interest groups and a host of other groups.

1.18 Modern Public Participation and its Flaw

Today, the practice of representative democracy is unlike Athenian democracy in that it allows and also encourages women to be active participants in decision-making. This is a good attribute and not a flaw. A notable difference between Athenian democracy and representative democracy is that, representative democracy requires the election of a representative whose role is to act on the behalf of the majority of the citizens. However, in most cases today, the interests of the public are usually opposed to those of the government in a public participation process and as a result public participation is characterized by a continuous struggle between the public and their representative governments (Taylor, 2003: 110). Therein lies the flaw. This struggle remains because representative governments sometimes take decisions without having adequate public participation process to inform people, create awareness, and create a platform where citizens can voice their views and opinions regarding a proposed decision by their government. There is evidence to suggest that there is room for improvement in the area of transparent and accountable public participation in South

Africa and around the world. It has been an evident pattern among the government to undertake developments with inadequate public participation and consultation. In South Africa it is the responsibility of the national provincial and local representative governments to create awareness among citizens, educate citizens about a proposed development, and also include them in the decision making process regarding the uptake of new development projects or technologies.

1.19 Lack of Transparency, Accountability Awareness and Public Input

Although South Africa has practiced over twenty years of constitutional democracy, South Africa has no transparent and participatory mechanism for democratically deciding on the authorization of new technologies or development projects (Fig (2012)). As a result of this lack, developments are undertaken often impacting on countless number of lives and livelihoods. The reasons that citizen's petition, protest or litigate against a development project, it because they are left out of debates that are often only confined to governmental and business circles (Fig, 2012). For this reason protests and litigation remain the only way for citizens to attempt to influence public policy and non-participatory based decisions (Fig (2012)).

One of the problems facing public participation in South Africa is increasing evidence that the process is viewed as a dialogue between the Executive and the people (Sabelo, 2011). A modern constitutional democracy should rather promote effective participatory governance between the electorate and their representatives in Parliament, provincial legislatures and local councils (Sabelo, 2011). Promoting participatory governance between these two groups in these three spheres, would cease the growing trend where the President and his cabinet are seen to be the only voices of authority that can address the problems of South African citizens (Sabelo, 2011). Regarding the implementing controversial technologies in the past, the government of South Africa has not made enough effort to consult the public (Fig, 2011). These include the construction of the pebble-bed modular reactor, the introduction of Genetically Modified food crops, and the e-toll scheme (Fig, 2011; Mail and Guardian, 2011).

Lack of citizen involvement in democratic states, regarding SGM has been evident in places such as Britain, Poland, China and Algeria (Franco, 2013). This lack of transparency and accountability in the implementation of development projects draws attention to a crisis in democracy worldwide. It reveals that a critical consideration for social and environmental justice needs to occur (Milicevic, 2014).

South Africa has been chosen as the case study because South Africa is said to possess the eighth largest unconventional gas reserves in the world. This that has made South Africa the centre of attention on the sub Saharan African continent with regards to energy. Secondly the ANC government has been faced with the task of addressing present inequalities that stem from the past apartheid regime, they are also expected to boost national economic development and ensure efficient service delivery (Visser, 2004). In addition to these responsibilities, there are laws, legislations and policies that require the ANC to represent the nation and protect South African citizens from having their rights infringed upon. These intersecting challenges of adhering to constitutional principles, amidst promoting secure and justifiable economic growth, employment opportunities whilst ensuring energy security, makes this an interesting topic to interrogate.

1.20 Research Methodology

This research is a desktop study that employs the qualitative research approach. Initially, preparations were made to conduct field research to gather information pertaining to the research topic. This is because information regarding the nature of public participation of the proposed fracking ventures in the Karoo basin during the initial stages of this study in the beginning of 2014 when this study was still in its proposal phase. However, as the government began pushing for the implementation of fracking, there arose an increase of informative sources such as journal articles, news paper articles, video documentaries and blogs that were made available. Pparliamentary videos, news videos and research documentaries also became available on YouTube and Vimeo. The information that was made available was abundant, convenient and less expensive to acquire. This research makes use of documented information on public meetings that have taken place in in the Karoo

dealing specifically with the proposed shale gas mining initiatives. Information was obtained from consultant firms such as ETHICORE consultants; non-profit organizations such as the Centre for Environmental Rights (CER), the SAFE (Sustainable Alternatives to Fracking and Exploration) Alliance which includes the Wilderness Foundation, Treasure the Karoo Action Group (TKAG), the Endangered Wildlife Trust (EWT) and the African Conservation Trust (ACT). This research shall also make use of journal articles, books and newspaper articles that specifically with the negative and positive impacts of shale gas mining. Videos from video sharing websites such as YouTube and Vimeo that document the views and opinions of Karoo community members and other interested and affected parties concerning the proposed shale gas mining project in the Karoo shall also be utilised. The websites of international oil companies that have applied for exploration rights such as Royal Dutch Shell, Falcon Oil & Gas and Bundu Oil & Gas, a subsidiary of Challenger Energy Limited, was sourced for information pertaining to the economic benefits and outcomes that may result from shale gas mining. South African legislation and policy documents such as the Bill of Rights of the Constitution of South Africa (1996), the Freedom Charter, Draft national Policy on Public Participation (2005), The National Environmental Management Act (NEMA), the Mineral Petroleum Resource Development Act (MPRDA) were also used. Each of the six research questions were addressed systematically where data was collected, analysed, interpreted and then tabulated. The findings of this study is aided by 90 journal articles, 40 electronic pdf documents, 71 websites, 19 books, 6 online videos comprised of fracking documentaries news reports, 4 government publications and 2 conference papers.

1.21 Research Aims & Objectives

The purpose of this research is to investigate the nature of public participation in the decision to implement SGM in the Karoo. When considering implementing a new technology or development, those who are affected by such a decision have the right to be involved in the decision-making process. For public participation to be meaningful, decisions that are made should incorporate the interests and concerns of those that stand affected by the decision. Public participation should also provide interested and affected parties with clear information that would allow them to participate in and influence decision making processes. The purpose of this study is to

identify the extent to which the interested and affected parties were given the opportunity to engage in a meaningful participation regarding the decision to implement shale gas mining and fracking in the Karoo basin: Whether the platform provided for IAPs was meaningful or not, and what could be done to improve current participation levels if need be. The research aims and objectives are reflected in the following research questions.

1. What is fracking and what does the process entail?
2. What are the known and unknown foreseeable positive and negative socio-economic and environmental impacts that accompany SGM?
3. What are the motivating factors behind the South African government & IOCs implementing SGE?
4. What are the views of opponents and advocates of SGM?
5. What is the extent to which public participation was conducted when SGM was banned, and when the moratorium on SGM was lifted?
6. What extent is public participation evident in the decision-making processes relating to the proposed implementation of SGM in the Karoo?

1.22 Reasons for Selecting the Respective Theories

Arnstein's ladder of citizen participation was chosen as one of the theoretical framework primarily because it is the most popular theory of participation when it comes to identifying the various levels of public participation. It has also been the benchmark for policy makers and practitioners that desire to enhance public participation. Public participation policies and documents around the world have adopted and incorporated Arnstein's ladder of citizen participation. Arnstein's ladder however as useful as it from the perspective of a developed world. It is for this reason that Choguill's ladder was used to supplement that of Arnstein's in this thesis. The concept of Choguill's theory regarding public participation is modelled after that of Arnstein's. The only difference is that Choguill focuses specifically on public participation within the context of the underdeveloped world. This makes it most relevant to South Africa's experience of public participation. Both of these theories provide useful definitions of public participation, and give clear gradations of each of the levels of public participation, from the levels that are non-participatory, to the levels that are participatory. The theories provide detailed

explanations of each level of participation. These two theories serve as a public participation road map that can help to identify the levels of public participation that a developed or underdeveloped nation may have attained. The higher the level of public participation, the deeper the democracy of the nation. The lower the public participation, the shallower the democracy of the nation.

1.23 Relevance of Theories in Relation to Research Questions

The first and second research questions are clear examples of crucial information that need to be understood by the public, affected communities and other IAPs. These provide so that they can be well informed in order to effectively deliberate the feasibility of implementing fracking in public participation meetings, and whether or not its implementation would be beneficial or not at the social, economic and environmental levels. Being adequately informed of what fracking is, and its perceived social, economic and environmental impacts could make public meetings more productive and may help decision makers become aware of information that they may not know about fracking.

The third question provides the views of government as decision makers regarding fracking. Underlying Motives as to why decision makers would want to implement fracking may help determine the extent to which they include the public in the decision-making and the way in which they go about conducting public participation. The fourth research question provides an important platform for deliberation in public participation meetings where various views of opponents and proponents regarding a matter (such as fracking) are pivotal in shaping the outcomes of decision making processes. The fifth and sixth research questions relate directly to the various gradations of public participation as illustrated by both Arnstein (1969) and Choguill (1998). These research questions give insight on how far South Africa as a democracy has come since independence. Higher levels of public involvement in decision-making is an indication of deep democracy, whilst low public involvement in decision-making is an indication of a democracy that is in need of significant improvement.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Stable energy reserves play an instrumental role in ensuring secure sound business operations, in addition to the development of a stable society. The purpose of this chapter is to critically outline the debate between opponents and proponents regarding the proposition for shale gas as a bridging fuel, and a sustainable energy resource. This chapter will begin by defining and conceptualizing fracking as one of the single processes of SGM, giving further insight as to what this single process entails. It will then proceed to present the arguments regarding the benefits and concerns of fracking. These will be obtained from existing arguments and research conducted on the controversial fracking debate, giving solid reasons as to why SGM should or should not be implemented. Opponents against the implementation of fracking argue that the lack of scientific evidence on the impacts of fracking does not make it a sustainable venture. Opponents make reference to documented cases of water and air pollution; land grabbing, ill health and community displacement. Proponents however argue in favour of fracking as a shale gas extraction method. Proponents state that shale gas is a cleaner source of energy than coal and oil. Proponents also state that SGM will generate revenue, create employment and enhance energy security, and the energy independence of states that produce fracking. The arguments of opponents and proponents will be presented under the following headings: energy security and independence, promises of prosperity, natural gas versus coal-the climate change debate, air pollution, earthquakes, promises of prosperity, land grabbing, water consumption, water pollution and health impacts. The remaining two sections of this chapter will present existing scholarly literatures dealing specifically with the nature of the Karoo fracking debate, and the nature of public participation in South Africa regarding the proposed implementation of fracking and other technologies.

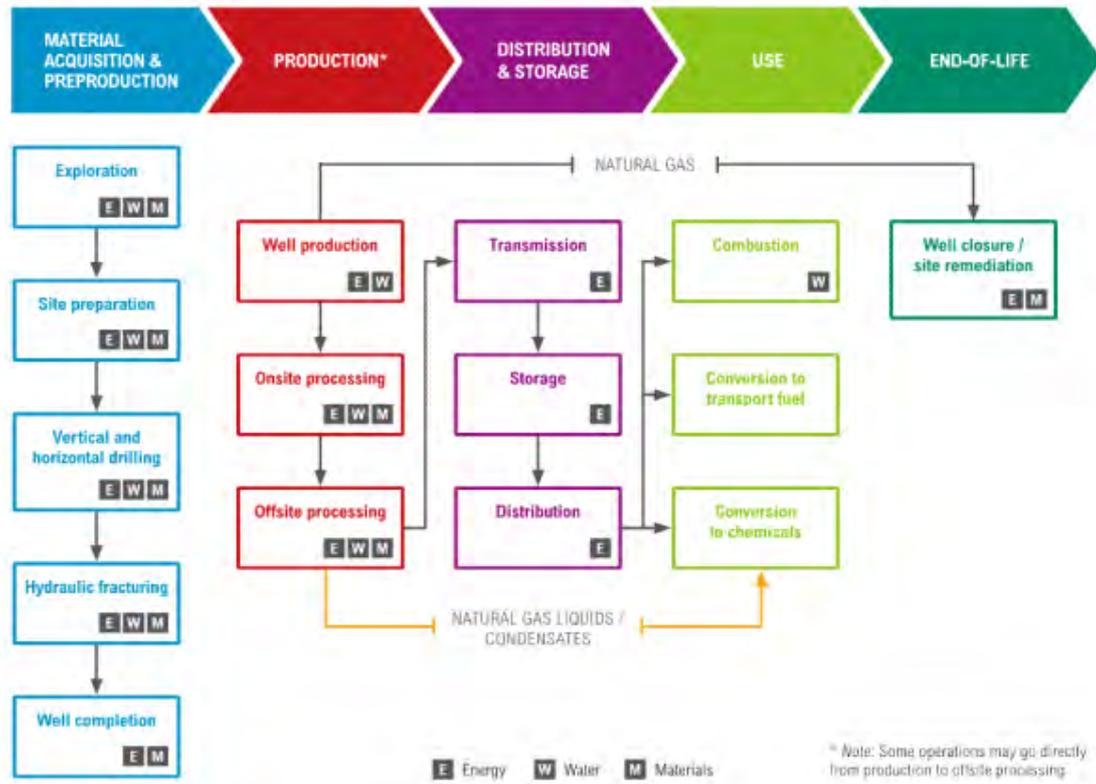


Figure 1: The Lifecycle Stages of SGM. Source: Branosky, Stevens & Forbes, 2012.

2.1 Conceptualisation & Definition of Fracking

According to Boudet et al (2014) and Goldman (2013) fracking is but a single part of the entire unconventional oil/ SGM development process. This single process falls under the Materials and acquisitions and preproduction phase of SGM as is illustrated in Figure 1. Fracking which is synonymous to the terms frac'ing and hydraulic fracturing is but one key step in what is considered an unconventional method for extracting gas from shale rocks or other types of rock formations such as coal bed rock formations that lie beneath the earth's surface (Franco, Martiznez & Feodoroff 2013; Goldman et al., 2013; Mitka, 2012). From figure 1 indicates that fracking occurs after exploration, site preparation and vertical horizontal drilling. Fracking is thus a part of the material acquisition and preproduction phase of SGM.

2.2 Description of the Fracking process

Figure 2 gives an illustration of the fracking process in some detail. Mining method of fracking a shaft is drilled kilometres into the earth vertically for about three to six kilometres depending on the exact location of the shale rocks (CBNCAfrica, 2014). The shaft is then turned horizontally and drills through a layer of the rock that contains the shale gas (CBNCAfrica, 2014). The frac occurs when a mixture of sand, chemicals and water is pumped at intense pressures (CBNCAfrica, 2014). The purpose of the sand in the mixture is to stop the fissures of the rock from closing again (CBNCAfrica, 2014).

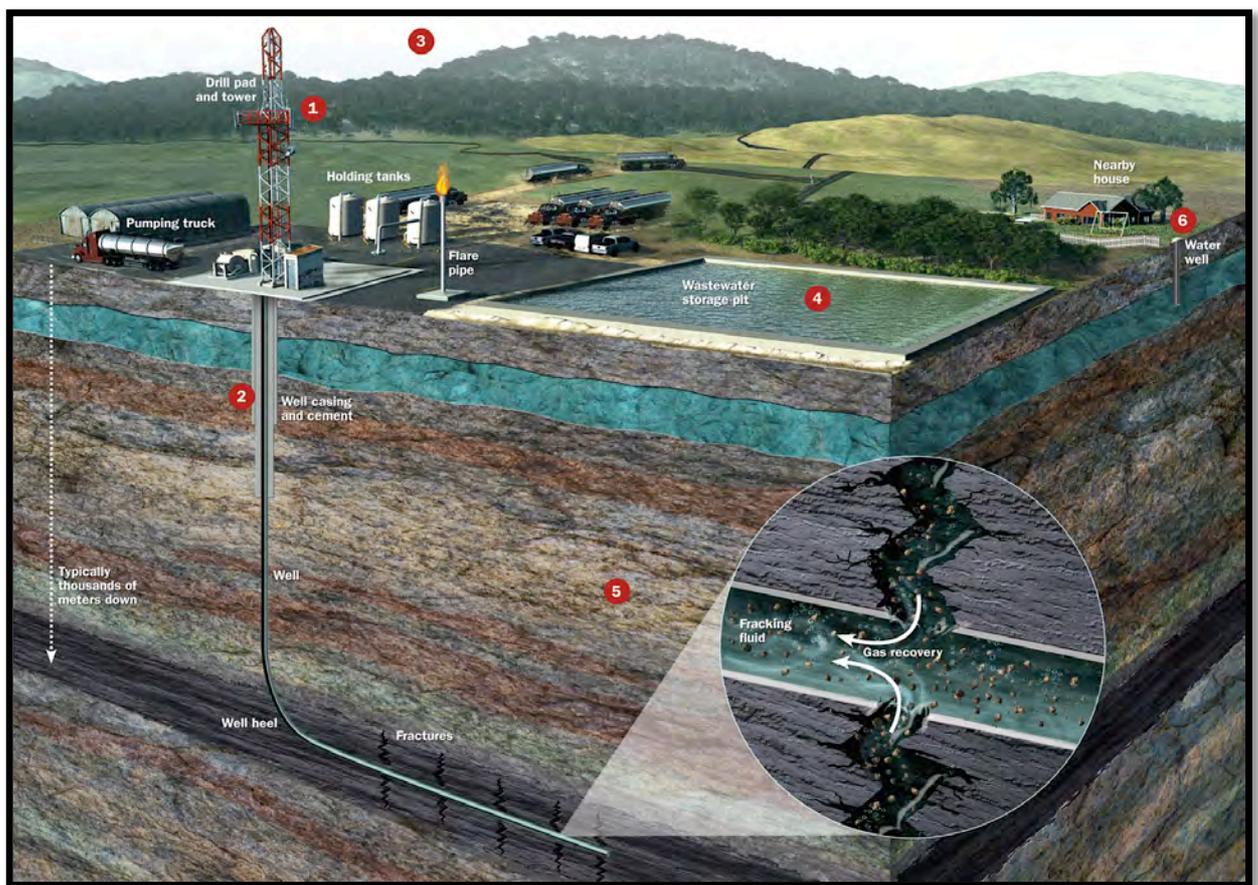


Figure 2: An illustration of the onsite fracking Process. Source: Sayostudios.org 2013.

2.3 Misunderstandings of the term ‘fracking’

There has been a great amount of confusion regarding the definition of fracking and what the process entails. The technocrats, namely the oil and gas industry and

scientists, use the word fracking or frac'ing to refer specifically to the single specific engineering process of hydraulic fracturing, a process which only takes a few days (Goldman, 2013). Often time's members of the general public, and news media use the word "fracking" to refer to the entire business of unconventional oil and gas development; from drilling to natural gas extraction (Thurston & Bell, 2013; Mooney et al., 2011; Goldman, 2013). The misunderstandings of what fracking is, has contributed to the escalated contentions between the public IOCs. Miscommunication and misunderstanding between the public, oil and gas industries and government lies in the context in which the term fracking is used. Scientists and other technocrats or technical experts from the oil and gas industry, refer to fracking as the actual activity of the completion down at four thousand feet, while the general members of the public in referring to fracking, and include the process of drilling casings and completion of the well (The Fracking Façade (2012)). It is for this reason that fracking has been blamed as the cause of water contamination resulting from gas migration into underground water reserves. In the short documentary video titled The Fracking Façade (2012) Cornel University Professor, Ingraffea, explains that it is impossible for the process of fracking to cause gas migration. Professor Ingraffea however, goes on to clarify this, stating that the drilling operations, bad cement jobs can cause gas to leak into the annulus till pressure builds up (The Fracking Façade, 2012). This causes the gas to leak into underground water resources (The Fracking Façade, 2012). It is therefore clear that the drilling process, which occurs near the surface of the earth, is where the chemicals are, and where gas migration is likely to take place (The Fracking Façade, 2012). In the same video documentary the Fracking Façade (2012) a representative of shell South Africa, when asked whether fracking caused water contamination stated that there was no documented case that showed that fracking caused water contamination. However when the representative was asked whether the process of mining caused ground water contamination, he stated that there had been documented cases of ground water pollution with mining activities as a whole (The Fracking Facade, 2012). The misunderstanding of the actual meaning of specific terms regarding SGM such as the term fracking for example is an indication that there is indeed a greater need for creating awareness and public involvement, especially when it comes to implementing technical development projects such as unconventional SGM.

2.4 Economic prosperity & Job creation

Apart from harnessing the potential to ensure energy security and energy independence, around the world, shale gas is promoted on the basis that it brings economic prosperity (Franco et al., 2013). According to Botha & Yelland (2011) fracking could be a mechanism for job creation for the significant Karoo population that live in abject poverty (Shell, 2013; Botha & Yelland, 2011). This significant group of people are in desperate need of Jobs, desire access to basic services such as schools, clinics, and are depending on local and national government and the private sector to help develop their living conditions for the better (Shell, 2013; Botha & Yelland 2011). It is said that fracking in the Karoo could create employment for this group of people (Shell, 2011; Botha & Yelland). Moreover, South Africa imports around seventy percent of its crude oil needs (Hope, 2014). Contributions at a national level could make South Africa self-sufficient in meeting its national energy demands (Hope, 2014). Thus according to Hope (2014) shale gas discoveries could therefore re-industrialize the South African national economy.

However, the long-term sustainability of the shale gas industry has been called to question. According to Food & WaterWatch (2011) the oil and gas industry-funded academics and ideological think tanks promote shale gas as a sure job creator. Their study reveals that shale gas job projections of the Public Policy Institute of New York State (PPINYS) contained numerous inaccuracies and flaws, to a gross exaggeration of the jobs that might be expected in New York if the state were to allow for shale gas development (Food & WaterWatch, 2011). Furthermore, according to Weber (2012) calculations from industries promoting fracking, fail to discuss the economic, environmental and health costs that accompany fracking. These industries and their representatives also fail to discuss the jobs that have been lost as a result of SGM ventures, for example jobs in the agricultural and tourism sectors. Regarding the promises of economic prosperity of shale gas, calculations of Weber (2012) indicate that one million dollars invested in shale gas production in the USA creates only 2.35 local jobs, which can be translated into an annual increase of employment by 1.5 percent. Moreover, Heinberg (2013) states that new and often temporary jobs are being offset by the damage done to existing industries...’ It has been reported that in

Pennsylvania (PA) many jobs created by the SGM industry go to skilled out-of-state workers who fly in, drill, and then fly back home (Heinberg, 2013).

In South Africa concerns of water shortages and global climate change, socio-economic issues of poverty, crime and unemployment persist (Gradin, 2012; Greeff, 2012; de Wit, 2011). Proponents of SGM in the Karoo support that SGM is the solution to all of these intersecting problems. The success of the solution however, will depend on the availability of shale gas resources in the Karoo. Based on the Econometrix Report, according to Bonang Mohale, Chairman of Shell South Africa, Shells' Econometrix report clearly shows substantial economic and job creation benefits to South Africa should economically viable gas resources exist in the Karoo (van Wyk, 2014; Econometrix, 2012; Shell, 2012;). A lack of Jobs is one of the greatest economic challenges currently facing South Africa. Statistics from Statistics South Africa (Stats SA) reveal that the total unemployment rate remains at about twenty five per cent, with at least four provinces exceeding forty per cent (Stats SA, 2012).

According to Greeff (2012) Shell's promises of ensuring safe fracking in the Karoo are "lies and if we listen to them we are fools". In substantiating this statement Greeff (2012) recalls how Shell was fined five billion dollars for its massive oil spills and ran an oil drill ship "*the Noble Discoverer*" partially aground the arctic. In 2013 it was also reported that Shell experienced 2.1 billion dollars in losses as the IOC struggled to make a profit from the unconventional oil and gas in North America off the coast of Alaska (Chazan, 2013).

In the video titled *Fracking in the Karoo-Short film for linked TV* documented by Jefferey Barbee, the chairman of the TKAG Jonathan Deal explained that the merits of shale gas are promoted based on short-term gains for a few Multi-National Oil & Gas Corporations and the current ruling party; a prosperity which is at the cost of the prosperity of future generations (Barbee, 2013). However, according to Botha & Yelland (2011) shale gas 'could' add much-needed primary energy diversity to South Africa's power generation industry, and create jobs in gas-to-liquid plants, combined-cycle gas turbine (CCGT) power stations, steel works and a variety of other plants,

factories and secondary commercial, business, transport and hospitality activities. There is also uncertainty about the exact amount of shale gas in the Karoo. Twice the US EIA has revised estimated figures of the amount of shale gas in the Karoo. Initially, it was estimated that South Africa had four hundred and eighty five trillion cubic feet (tcf) making it the nation with the fifth 5th largest shale gas reserves in the world. This figure was later revised, positioning South Africa as having the eighth largest shale gas reserves in the world. The uncertainty of the amount of shale gas in the Karoo has brought about uncertainty regarding the economic viability of shale gas in the Karoo. The Econometrix study commissioned by Shell, discusses economic benefits that shale gas would bring to the South African economy. The study discloses that if there were twenty trillion cubic feet (tcf) of economically viable shale gas, this would translate into eighty billion rands, or 3.3 % of GDP. If there were forty tcf, this would translate into two hundred billion rands, or 9.6 % of GDP (Econometrix, 2012). The first estimates generated indicate that shale gas could result in the creation of three hundred thousand jobs and the second estimate, seven hundred thousand jobs (Gosling, 2014; Econometrix, 2012). The results of Shells Econometrix report has however been criticised as being flawed and too optimistic. In spite of this there is evidence of shale making small positive contributions to recent job growth in Pennsylvania, USA.

2.5 Energy security and Sovereignty

Energy is a critical resource that powers machines and allows humans to accomplish tasks beyond the limits of their own muscular strength (Littlefield, 2013). Energy is a purposeful source of fuel or electricity that allows states to power their industries, contributing to their national economic growth (Littlefield, 2013; Yergin, 2006). The International Energy Agency (IEA) defines energy security as “the uninterrupted availability of energy sources available at an affordable price” while respecting environmental concerns (IEA, 2014; IEA, 2011). Energy independence was defined by President Nixon in his November 1973 introduction of the “Project Independence” as a situation in which domestic energy production is adequate to “meet our own energy needs without depending on any foreign sources” (Morris, Nivola, & Schultze, 2012; Yergin, 2006). According to Littlefield (2013) infrastructural robustness, diversity of energy sources, and reliability are critical components of energy security.

These requirements for ensuring a secure energy grid must be met to holistically account for the efficient delivery of energy services to end users.

Currently the world is facing an energy crisis as fossil fuel sources of coal gas and oil are dwindling and experiencing price hikes as a result (Abas, Kalair & Khan, 2015; Shell, 2013). Moreover global greenhouse gas emission data reveals that fifty seven percent of greenhouse gas emissions results from the use of fossil fuels.

It is for this reason that the unconventional shale gas and oil resources are being promoted as bridging energy sources to renewable energy. Furthermore unpredictable increases in electrical energy costs and the soaring oil prices, concerns about 'peak oil', and growing public awareness of environmental depletion, have made diversification of energy sources in a 'sustainable' manner, an urgent matter for both governments and corporations (Negro, 2012; Franco, Martinez and Feodoroff, 2013). The promotion of SGM by industry, consisting of diverse public and private transnational and national institutions, and actors, are the driving force behind the effective and attractive marketing of SGM (Franco, Martinez and Feodoroff, 2013). The USA, being the key leader in shale gas production continues to play a crucial role in promoting unconventional gas mining as the ideal way of ensuring national energy security and national economic development (Franco, Martinez and Feodoroff, 2013).

According to Ratner & Tiemann (2015) for over one hundred years, the U.S.A has always been an exporter of natural gas to countries such as Canada, Mexico, and almost exclusively to Japan, from Alaska. These exports however, were in small quantities as compared to the amounts of natural gas that the USA imported (Ratner & Tiemann, 2015). Owing to the oil and gas boom, in 2011 the USA became a net exporter of fuel for the first time in twenty years since 1949, as rising exports combined with slower imports (API, 2014; Mills, 2014). Furthermore it was predicted that pipeline exports that accounted for ninety nine percent of all exports of USA's natural gas in 2013, were likely to experience further increase (Ratner & Tiemann, 2015).

In the USA, the use of hydraulic fracturing and horizontal drilling has pushed down the costs of shale gas production, making it a very economically feasible venture (Deutch, 2011). According to Deutch (2011) the cost of production of unconventional shale gas ranges from between two to three dollars per thousand cubic feet. Large

quantities of shale gas have become technically recoverable (Deutch, 2011). In the year 2000 shale gas only accounted for one percent of US production (Steven, 2010). By the year 2009 shale gas production was sitting at twenty percent (Stevens, 2010). Unconventional shale gas production in the USA increased from just over thirty six billion cubic metres (cbm) in 2007 to over two hundred ninety three billion cbm in 2012 (Energy Information Administration, 2014). It has been predicted that shale gas extraction in the USA will reach four hundred and seventy billion cbm a year, by 2040 (Scholvin, 2015). By 2040 fifty three percent of natural gas production will come from shale gas, turning the USA from an energy importer to an energy exporter, thus ending USA's dependence on external suppliers (EIA 2014; Fig & Scholvin, 2015). Shale gas has become a cornerstone of USA's energy policy (Schulzová, 2013). USA's reliance on Middle Eastern imports has also decreased significantly as a result of the shale gas boom (Deutch, 2011). Deutch (2011) states that countries that control the bulk of conventional natural gas reserves such as Saudi-Arabia, Iran, Qatar, Russia and Turkmenistan will have their geopolitical influence lessened (Deutch, 2011). This is because as more natural gas becomes available and as more of it is traded, competitive nature of energy markets will cause the prices of natural gas to decrease (Deutch, 2011).

A study by PricewaterhouseCoopers (2011) predicts that the shale gas boom could create an additional one million jobs in the USA by the year 2025. In spite of these benefits, fracking as a single process, and the overall unconventional shale gas and oil production, continues to provoke concerns about public health and safety of the natural environment (Keyyem, 2011). Polarised views of fracking have pitted scientists, activists, and the energy industry in a seemingly endless battle over the trade-offs involved in creating a long-term sustainable energy economy (Keyyem, 2011). Advocates of fracking promise creation of job opportunities and increases in government revenues (Franco, Martinez and Feodoroff, 2013). Opponents claim that earlier predictions of increased jobs are too optimistic (Schlovin, 2015).

In the face of these controversies, the government of South Africa, the ANC, has remained optimistic about shale gas extraction ventures. They see the mining of shale gas as a way for substituting imported fuels, and as a path to increased energy security for South Africa (Fig, 2014). Having been faced with the task of ensuring equality for all, the government of South Africa is responsible for developments that are socio-

economically and environmentally sustainable. In his State of the Nations Address in 2014, South African president Zuma declared shale gas to be a “game changer”. Furthermore, Karen Breytenbach of South Africa's Department of Energy noted the introduction of natural gas into the country's mainstream energy supply was crucial for South Africa’s energy crisis (CNBC Africa.com, 2014).

2.6 Eskom’s energy crisis

South Africa’s sole utility, Eskom, has been struggling to meet the nations increasing electricity needs (Kessides, 2014). Dwindling coal reserves coupled with an increase in national energy demands continue to result in both scheduled and sporadic power outages (Byrd & Matthewman, 2014). The nation-wide power cuts began in the late months of 2007 and was suspended in May 2008. Load shedding resumed in November 2014. South Africa’s industrial sector accounts for about sixty seven percent of South Africa’s total electricity consumption (EOSA, 2002).

Gordon (2013) states that fracking for shale gas may help to meet the industrial and domestic energy demands, and could create a market that will generate revenue from exporting of natural gas to other countries. According to Tucker & van Tonder (2014) shale gas fracking in the Karoo of South Africa promises to make vast reserves of oil and gas available to help meet a significant percentage of the country’s energy needs for many years. According to the Department of Mineral Resources (DMR) (2012) fracking promises to augment South Africa’s energy resources by decreasing the dependence on intensive coal whilst expand national capacity to produce electricity (p.25). South Africa alone accounts for forty two percent of Africa’s carbon dioxide (CO₂) emissions (Kohler, 2013). Advocates of SGM maintain that the natural environment could profit from decreased carbon emissions by using shale gas for energy production.

Since fracking has brought about some tangible benefits in the USA, there are assumptions that the same benefits are guaranteed for South Africa (de Vos, 2014). de Vos (2014) states that this may not be the case because most of the USA’s shale gas has been found in a shale formation known as the Marcellus Shale, which at its maximum depth is located at only two Kilometres underground. The Karoo shale is,

however, located at much lower depths at around four kilometres, which will make shale gas more difficult and expensive to extract in South Africa than in the USA (de Vos, 2014). In South Africa wells will have to be drilled deeper and as a result, will require more water and chemicals than in the USA (Treasurethekaroo.co.za, 2011). Another reason that the benefits of the Shale gas boom experienced in the USA may not be replicated in South Africa, is that South Africa has its own unique political and natural environments that require strategic policy choices that no other nations' experience or energy revolution can entirely inform (Hedden, Moyer & Rettig 2013).

2.7 Shale gas and the Climate change debate

Advocates of SGM assert that the USA has been able to increase its electricity generating output and reduce its CO₂ emissions via substituting coal for unconventional gas/oil (de Vos, 2014). With many countries attempting to reduce their carbon footprint, fracking of shale gas has been presented as the cleaner energy source than fossil fuels such as coal and oil (Howarth, Ingraffea, Engelder, 2011; Franco et al., 2013 Franco, Martinez and Feodoroff, 2013). Cohen and Winkler (2014) conclude that shale gas produces less GHG emissions per megawatt hour of electricity generated than coal. It is believed that using natural gas can help to lessen current levels of GHG emissions while still ensuring the supply of abundant energy until a significant transition to RETs is made (Jenner & Lamadrid, 2013, Howarth, Ingraffea & Engelder, 2011; Olah, 2005). The environmental risks of shale gas far outweigh the perceived benefits, and shale gas production can help to alleviate global warming (Howarth, Ingraffea & Engelder, 2011). According to Busch & Gimon (2014) while natural gas is often hailed as a cleaner alternative to coal and oil, the reality is more complex. Cathles et al (2012) and Barceló (2011) critique Howarth et al. 2011, stating that they over estimate the fugitive emissions associated with shale gas production.

According to Cathles, Howarth does not take into account the technologies that are available to reduce the fugitive emissions. Furthermore, according to Bradbury et al (2013) the estimation of Howarth et al., 2011, of GHG emissions from shale greatly

exceed those from other published LCA studies. Natural gas should in theory release less GHG emissions with positive implications for global climate change (Wrigley, 2011). Amongst coal and oil, natural gas has the lowest GHG footprint (Wigley, 2011; Cathles et al., 2011). If methane leakages are reduced during the production phases, natural gas could prove cleaner than coal and oil (Busch & Gimón, 2014). On the contrary Howarth, Ingraffea & Engelder (2011) argue that shale gas is not clean and should not be used as a bridge fuel till RETs are sufficiently developed to handle a significant amount of the USA's energy needs because natural gas from shale comes at a great cost to the environment (Howarth, Ingraffea & Engelder, 2011) and to communities (Goldman, 2013). The same is proposed for countries around the world that harness exploitable unconventional shale gas reserves.

Using both long-term GHG emissions scenarios, it has been argued that over a longer period the potency of methane in propagating the effects of climate change is far worse than that of CO₂ (Howarth, Ingraffea & Engelder, 2011). The drilling, extraction and transportation of oil and natural gas through pipelines result in leakage of methane, which is a potent heat-trapping gas, is twenty-five times stronger than that of CO₂ at trapping heat in the atmosphere over a twenty-year period, and even over a one-hundred-year period (Forster et al., 2007, Howarth, Santoro & Ingraffea, 2011; Tollefson, 2012). Fugitive emissions from methane still have the potential to contaminate surface water aquifers and cause air pollution. If significant amounts of methane emissions occur during shale gas extraction and production, it could effectively cause it to lose its environmentally-friendly advantage that it is said to have over coal and oil as a cleaner source of energy (Tollefson, 2012). In a PowerPoint presentation compiled by Howarth (2015) Professor Howarth states that methane emissions of shale gas make shale gas a bridge to nowhere (Cornell University, 2015).

2.8 Air pollution

A major concern for those living in and around fracking development is the increased amount of air pollution (Colborn et al., 2011; Howarth, Ingraffea & Engelder 2011; Shafer, Williams & Mook, 2012). Potential air pollutants from fracking operations

include: Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), dust, natural gas, carbon monoxide, hydrogen sulphide, nitrogen oxides, ozone, particulate matter, and sulphur dioxide (Shafer, Williams & Mook, 2012). According to Shelley (2011) chemicals used in fracking are known to cause respiratory problems such as asthma, heart conditions and lung damage. An article written by Brown (2007) titled *Industry issues: Putting the heat on gas*, recounts triggers of complaints from citizens from Colorado's Garfield County that petrochemical pollution has caused adrenal and pituitary tumours, headaches, nausea, joint pain, respiratory problems, and other symptoms. The CER (2013) maintains that if fracking is to take place in South Africa, one of the legislative frameworks that it has to adhere to is that of the Air quality Act (AQA) no. 39 of 2004. The National Environmental Management: AQA maintains that the quality of air in many areas in South Africa is not conducive for a healthy environment for the people living within those areas. The burdens of polluted ambient air falls mostly on poor people. The level of ambient air quality should be maintained sustainably as to promote social advancement in South Africa (environment.gov.za).

2.9 Earth quakes

The valid arguments supporting the recommendation that shale gas initiatives should not be implemented stem from documented evidence that fracking has proven to be a dangerous activity. Northrup (2010) states that the pressure used in fracking operations to break up the underlying rocks is fifteen thousand pounds per square inch (psi), which is equivalent to the water pressure six miles deep in the ocean. Northrup goes on to compare the pressure used in fracking as thirty more times more potent than a thermobaric air bomb. Thermobaric weapons are explosives that are enhanced to produce heat and pressure effects (Wildegger-Gaissmaier, 2004). Scientific evidence from the *National Journal Reports* indicates that that fracking caused a series of earthquakes in Youngstown Ohio, a city that had not experienced an earthquake since 1776 (Resnick, 2013). However, Gordon (2013) states that whether fracking causes more earthquakes remains unclear (Gordon, 2013). de Wit (2011) states that it is unlikely that fracking will cause earthquakes in the Karoo due to the relatively stable nature of its geology. According to Loris (2012) and Robertson &

Rubinstein (2015) the fracking process itself does not cause earthquakes; it is rather in rare instances that the use of underground injection wells for the storage of wastewater that causes earthquakes. Other scholars also endorse that the injection of fluids deep into fracking wells causes an increase of small earthquake activities (McGarr et al., 2015; Mercardo, Álvarez & Herrandz, 2014; Kerr, 2012). The disposal of wastewater frac-fluids however, is not part of the fracking process, but rather part of the oil and gas production phase (Rubinstein & Mahani, 2015).

2.10 Potential Land grabs

Land grabbing is the method of land expropriation and displacement put in place by governments within their country's borders to increase development (Siciliano, 2013). Franco, Martinez & Feodoroff (2013) and Fig (2014) analyse fracking initiatives in the Karoo at a deeper level, identifying fracking of unconventional gas resource as a new resource grab that is targeting the acquisition of both land and water. The shale gas initiatives leaves over twenty percent of South Africa's land vulnerable to acquisition by IOC's (Fig, 2014).

Neo-liberal expression of land grabbing through large-scale development initiatives deepens inequalities and creates a new class of landless peoples (Sharife, 2012). Lands used for subsistence and commercial agriculture and pastoral farming, food security and sovereignty will remain threatened. Fracking in the USA is turning many rural environments into industrial zones (Shugarman, 2014). Land grabbing through fracking could exacerbate the critical shortfalls for both food security and poverty alleviation initiatives that may exist in the Karoo (Fig, 2014). Governments in underdeveloped countries have a principal responsibility for fostering the development of smallholder farmers and pastoralists through comprehensive agricultural development programs. It has also been discovered that animals that are exposed to chemicals used in fracking are finding their way into the open market for consumption (Royte, 2012).

2.11 Water Consumption & Water Pollution

The two main environmental concerns of fracking are water consumption and water pollution (Howarth, Ingraffea & Engelder, 2011; Negro, 2012). Fracking uses large quantities of water, which is mixed with sand, and chemicals that are injected into shale rock to release natural gas (BBC News, 2013). According to the Treasurethekaroo.co.za (2011a) one fracking well requires twenty million litres of water. Sixteen wells use over three hundred million litres of water (Howarth, Ingraffea & Engelder, 2011). Water stressed semi-arid regions such as Texas in the USA, and the Karoo in South Africa bear similar concerns regarding the water intense nature of fracking operations (Fig, 2012). In easing concerns about high water volume usage, at the Colorado School of Mines researchers have been testing a new way to open oil and gas deposits tightly locked in shale rock without using a single gallon of water using a technique called cryogenic fracturing (Kohl, 2014). In this process water is substituted for liquid nitrogen or CO₂ at temperatures below minus one hundred and sixty one degrees Celsius, is pumped underground at intense pressures to release gas (Kohl, 2014).

Water pollution may occur underground, with fracking chemicals or methane directly contaminating aquifers and drinking wells, or above ground, as streams or tributaries are polluted by spills or improper wastewater disposal (Browning & Kaplan, 2011). According to Eggink (2011) a report of the United States Energy Department that examines the possible health, and environmental effects of fracking, verifies that when a well is designed and constructed properly, applying the best drilling principles and practices groundwater do not risk being polluted. Some scientists who have studied the unique geology of the Karoo with its widespread intrusion of dolerite dykes and sills have voiced concerns that there is a possibility of fracking contaminants reaching ground water systems (Cramer, 2014; Tucker & van Tonder, 2014). In places such as Ohio and PA there have been documented cases of ground water contamination near oil and gas wells (Myers, 2012; Ohio DMRM 2008). Pennsylvania department of Environmental Protection (PADEP) compiled a list of identified incidences where private water resources were polluted by gas development (Colaneri, 2014). According to Loris (2012) reported incidents of hydraulic fracturing contaminating underground aquifers, and drinking water is a myth. There have been no instances of fracking causing contamination to drinking water. Furthermore (Loris,

2012) states that companies construct wells with steel surface casings and cement barriers to prevent gas from migrating into water reserves. Moreover, in a debate Professor Phillip Lloyd of the Energy Institute at the Cape Peninsula University of Technology (CPUT) stated that there was minimal evidence that water used in fracking polluted underground water resources. Furthermore, he stated that chemicals used in fracking constituted only half one percent of the total mixture, and if it were mixed with drinking water, the water would still be fit for human consumption (Botha & Yelland, 2011).

Pollution remediation technologies from Ozonix Technologies Inc. are available in the USA (Friend, 2012; Reece 2010). These technologies do not use chemicals and can efficiently remediate severely polluted water resources (Reece, 2010; Ecospheretech.com, n.d). This technology was used to help clean up oil spills in the Gulf of Mexico (Boman, 2012; Reece, 2010). The problem is that these technologies are very expensive to use, and are not available in South Africa as yet. In the case of the Karoo, water is of utmost concern considering the fact that ninety four percent of the towns in the Karoo depend on groundwater and could be affected by fracking. Using freshwater reserves in the Karoo will increase the vulnerability of access to water and increase the regions susceptibility to drought (Hedden, Moyer and Rettig, 2013). Mr Vegter a proponent of fracking argues that fracking operations should by no means affect South Africa's forty-five billion litres of national fresh water resources (Botha & Yelland 2011).

2.12 Auditory Impacts

Opponents of fracking point out that SGM comes at a great cost not only because of the water pollution and health impacts; there exists other impacts from the other processes that make up the full lifecycle of SGM (Hill, 2014). Noise pollution is a source of aesthetic concern and is considered a nuisance (Ferrell & Sanders, 2013). Horizontal shale gas drilling is a very loud operation that generates noise pollution (Srebonjak, 2014). Other impacts of fracking that are considered noisy include activities such as truck movements, gas flaring, fracking waste treatment, compressors, generators, wire line logging and drilling (Hill, 2014). According to Witter et al., (2008) heightened noise levels are present in all various stages of

unconventional oil and gas development. Construction noise, vehicle noise, pumps and condensers all contribute to noises that will arise from activities conducted on a well pad. Ferrell & Sanders (2013) propose noise mitigation measures such as the instalment of mufflers, sound blankets, sound walls and also operational hour restrictions to minimise noise impacts from SGM.

Most opponents of SGM call for a moratorium on shale gas development to allow for better study of the cumulative risks to water quality and quantity and its impact on climate change (Howarth, Ingraffea & Engelder, 2011). Opponents argue that an appropriate framework can only be developed once comprehensive knowledge on the effects of fracking is obtained (Howarth, Ingraffea & Engelder, 2011). Most opponents of fracking advocate that the precautionary principle is used when it comes to the proposed implementation of fracking. The precautionary principle asserts that preventative action should be taken in the face of uncertainty (Bamberger & Oswald, 2012; Finkel & Law, 2011; Steinzor, Subra & Sumi, 2013). The precautionary principle is both a moral and political principle, which encourages policies that are geared to protect human health and the environment in the face of uncertain risks (Shelley, 2011; Gouin, 2010; Kriebel et al., 2001). South Africa's NEMA and AQA deal with auditory related impacts that may stem from development projects.

2.13 Health Impacts

Opponents further their arguments against fracking citing the toxic, mutagenic and carcinogenic nature of many of the additives that are used in the process of fracking (Howarth, Ingraffea & Engelder, 2011). This raises serious concerns about the potential health impacts of SGM. There are respiratory problems that have already been discussed; there are also skin and eye irritations that result from contact with fracking chemicals (Shelley, 2011). A study conducted by McKenzie et al (2012) indicate that there is a positive association between greater density and proximity of natural gas wells within a ten mile radius of maternal residence, and greater occurrences of congenital heart disease and neural tube defects. This study also shows the likelihood of fracking chemicals causing cancer and other mutations amongst people living close to well pads of natural gas development sites (McKenzie, 2012;

Colborn et al., 2011). According to Colborn et al (2011) chemicals used during natural gas operations have the potential to disturb the skin, eyes, other sensory organs, the respiratory organs, gastrointestinal systems, the brain, nervous systems, the heart, and kidneys.

Studies conducted by Bamberger & Oswald (2012) show that fracking can have serious consequences on the livelihood of livestock farmers, and the health of their animals. It has been reported that goats that were exposed to leakages of frac-fluids suffered from reproductive problems for over two years (Bamberger & Oswald, 2012). Another case revealed that the consumption of grass that had been polluted with frac-fluids caused cows to give birth to still born calves with congenital defects (Bamberger & Oswald 2012). In Louisiana, waste water fluids from a fracking operations leaked into a pasture where cows were grazing and killed seventeen cows within an hour (Bamberger & Oswald 2012). These cases point to the fact that fracking may lead to livestock and wildlife habitat destruction in the farming regions of the Karoo and may have the potential of contaminating meat.

With all the scientific studies that have been conducted by scientists and scholars and field experts in the industry there is still uncertainty as to whether countries should pursue SGM or not. It is therefore clear that further studies need to be done regarding the impacts of fracking as a single process, and all the various impacts that may stem from the lifecycle of SGM – from the preproduction stage, production stage, distribution and storage, use, and end of life.

The *Supplemental Generic Environmental Impact Statement* (SGEIS), a seven-year long study on the impacts of fracking was released in May 2015 by the New York Department of Environmental conservation (Dec.ny.gov, 2015). This study concludes that fracking operations would have potentially significant negative impacts on the natural environmental, flora and fauna (Dec.ny.gov, 2015). The SGEIS report also states that the significant uncertainty around the extent of documented risks and the impacts that threaten the environment and public health remains a major factor (Dec.ny.gov, 2015). Furthermore, based on scientific information, The Bulgarian Academy of Science (2011) states that the environmental risk caused by the usage of hydraulic fracturing for exploration and exploitation of shale gas fields cannot be evaluated as minimal or acceptable in all possible cases (Drinov, 2011).

2.14 Scholarly perspectives on the Karoo frack-debate

The debates concerning fracking in the Karoo is a product of the tension between the biological degradation it could cause, versus and the growing energy difficulties in South Africa (Tucker & van Tonder, 2014). Various debates that have taken place have been documented in the form of scholarly literature, live audio and videos. A faction of scholars involved in the debate believe that fracking in the Karoo should be allowed. Another faction of scholars believes that fracking should not be allowed because of the risks that are associated with the activity. Some scholars decide to keep an open mind regarding the issues, while others believe that fracking in the Karoo will not happen (Cramer, 2014; Truter, 2012). A seminar held by Cramer at the University of KwaZulu Natal (UKZN) titled '*six reasons why the Karoo will not be Fracked if reason prevails*', gives six insightful reasons as to why fracking may not take place in the Karoo. 1) The nature of the Karoo geology, 2) The lack of water in the Karoo, 3) the non-existent natural gas infrastructure, 4) U.S. shale success not applicable to South Africa, 5) problematic legal framework and South Africa's poor investment climate (Cramer, 2014). Regarding the Karoo geology, there is little knowledge about the deeper levels of ground water and preferential pathways along which frac-fluids could travel along dolerite dikes into drinking water supplies (Cramer, 2014; Jansen, 2014).

The second reason that there is simply not enough water available in the water stressed Karoo for fracking to take place. Moreover, trucking water from outside the Karoo would be too expensive and impractical. The Third reason crammer gives is that was that there is currently no infrastructure of pipeline network power and power transmission lines in The Karoo (Cramer, 2014; Jansen, 2014). The high cost of gas production in the Karoo will require large infrastructure investment demands, both from public and private sources, and this will prove very costly (Jansen, 2014). Moreover due to the unfavourable constraints the benefits of shale gas in the USA cannot be duplicated in South Africa (Cramer, 2014; Jansen, 2014). This is because the USA is characterized by gambling investors, greedy bankers and landowners who own the mineral rights to their properties (Cramer, 2014). Another reason that has been given has to do with the poor investment climate that South Africa has because of corruption which is evident across the various levels of government, the spate of violent protests, much red tape, and also Eskom's incapability to provide a stable

supply of electricity (Cramer, 2014; Jansen, 2014). States that at present international banks remain reluctant to make investments in South Africa (Cramer, 2014)

Furthermore, Truter's (2012) article titled *Zoning bombshell Could Scupper Karoo fracking* states that because the minister of mineral resources decision to lift the moratorium on fracking does not mean we are likely to see drill rigs erected in the Karoo anytime soon (Truter, 2012). According to Truter (2012) most of the land in the ninety thousand kilometres proposed exploration area is zoned rural or agricultural. This does not permit fracking or any form of deep drilling as a land use under the Land Use Planning Ordinance (LUPO) legislation (Truter, 2012). Before fracking can occur land in the proposed area will have to be rezoned. The process of Rezoning land however will require a lengthy process of public consultation (Truter, 2012). Vermeulen (2012) states that the rock composition of the Karoo makes the Karoo a unique case since the type of rock has not been a factor in hydraulic fracturing and exploration elsewhere in the world. According to de Wit (2011) if SGM explorations are to take place in South Africa then independent and reliable policing of all its processes is crucial (de Wit, 2011).

Analysis of scholarly literature regarding fracking in the Karoo shows that further research needs to be done before any fracking can take place, to better understand the impacts of fracking as a single process of fracking, along with the other processes that constitute the lifecycle of SGM. In Botha & Yelland article, Dr Chris Herald states that the footprint of shale gas operations will be very small compared with the size of the Karoo (Botha & Yelland 2011). Dr Herald concludes his conviction for developing shale gas, stating that we would be insane not to pursue its investigation. Hedden, Moyer and Rettig (2013) conclude that the development of shale gas in the Karoo could either turn out to be a blessing or a curse.

2.15 Lack of Transparency by Government & IOCs

Regarding the uptake of new technologies, South Africa has had a poor track record especially when it comes to conducting fair and transparent public participation (Fig, 2012). Instances regarding the uptake of technology and development include the construction of the now non-operational pebble bed modular nuclear reactor, and the introduction of genetically modified crops in South Africa (Fig, 2012). Lues (2014) suggests that the success of South Africa's democracy is dependent on the integration of the roles of government, and the public in order to ensure accountability, transparency, effectiveness and good quality provision of public services. The lack of public consultation regarding fracking and SGM has been met with stiff opposition from environmental groups such as the TKAG, the Sustainable Alternative to Fracking and Exploration alliance, the Southern Cape land committee and Land owners in the area (van Wyk 2014). A significant number of the Karoo populations still do not know what fracking is and how it may affect them (CBNCAfrica, 2014). Anti-fracking campaigns initiated by these environmental groups have contributed significantly in creating an awareness of fracking amongst the public, especially those in the Karoo that do not have any access to any means of informative resources (TKAG, 2015).

Discussions and decisions pertaining to whether to pursue SGM and fracking in South Africa should be informed, inclusive and also include multidisciplinary contributions, and value all interests and concerns equally (Temper et al., 2013: p 104). According to Jonathan Deal “ the lawful requirement of public consultation appears to have been overlooked by the DMR although the DMR have repeated promises and commitments from senior officials of the Department to conduct appropriate consultation” (TKAG, 2015). Moreover de Wit (2011) states, “unless systematic and independent baseline data on seismicity and groundwater quality... are made available for public scrutiny, environmental safety and scientific knowledge, public confidence will remain compromised” (p.5). de Wit (2011) also recommends that the IOCs, South Africa’s energy industry and South African government, academic researchers and local communities should collaborate to develop innovative technologies that will aid in minimising and mitigating the risks and negative impacts of SGM and fracking (de Wit 2011)

2.16 Conclusion

The contentious debate on fracking is characterised by the polarized views of democratic governments, IOCs against those of most citizens and environmentalists. Opponents of fracking state that fracking is a dangerous activity in that it may cause water pollution, uses large quantities of water, and proves to make those that come into contact with its chemicals, develop severe illnesses. Proponents of fracking argue that fracking could bring about energy security and energy independence to those nations that pursue SGM. Other added incentives include employment opportunities and lower GHG emission reduction. Opponents of fracking describe fracking as a land grab and water grab initiative. Regarding proposed SGM initiatives in the Karoo, proponents of SGM argue that South Africa could duplicate the same benefits that the USA has enjoyed from its SGM and fracking ventures. Some scholars argue that the cost of extraction of shale gas in South Africa would not be economically feasible due to the lack of adequate infrastructure for SGM, and the depth of shale gas resources and tough geology of Karoo rocks. Water scarcity in the Karoo makes fracking in the Karoo very impractical since fracking requires large quantities of water. Others argue that some South Africa facing unemployment and lack of access to basic goods and infrastructures could stand to benefit from some of the jobs that fracking could bring directly to the Karoo, and also to other industries in South Africa. Moreover it is stated that the looming energy crisis facing the country requires a diverse source of energy of which shale gas could make a significant contribution. Currently, the position as to whether shale gas is the best way forward for South Africa remains uncertain. However, when taking into cognizance principle of sustainable development and the precautionary principle, it may be safer to forgo fracking until effective measures are developed to minimise both the social and environmental consequences associated with SGM and fracking.

CHAPTER 3: THEORETICAL FRAMEWORK

3.0 Introduction

Public participation is a mechanism that affords the citizens of democratic states the right to participate in decision-making. Public participation makes it possible for representative governments to engage with their citizens, inform them, and educate them about proposed developments, i.e. ventures such as SGM and the implementation of technologies such as fracking. From the time of ancient Greek city-states till date, public participation remains the cornerstone of all democracies. In South Africa public participation is promoted in governmental publications that take the form of Constitution of the Republic of South Africa (1996) and NEMA. This chapter provides a theoretical basis for public participation as a major component in the decision-making process. It begins by discussing various scholarly and institutional definitions of public participation, definitions from various scholars and documents such as the Public Participation Guidelines for Stakeholders in the Mining Industry First Edition handbook on Public participation (2002), the Public Service Commission (2008), and the Australia South Africa Local Governance Partnership (ASALGP handbook on public participation. Moreover the historical origins of public participation and the nature of public participation in neo-liberal democratic states shall be discussed. This chapter shall also analyse the various South African legislation and policy documents that deal with the subject of public participation. Two main various theoretical perspectives that advance the importance of public participation and the various gradations of public participation will be discussed. These theories two theories are those of Arnstein's (1969) ladder of citizen participation and Choguill's (1998) ladder of community participation for underdeveloped countries. Arnstein's ladder of citizen participation was chosen as part of this theoretical framework is because it has been the touchstone for policy makers promoting public participation globally (Tritter & McCallum, 2006). Choguill's (1996) was used to supplement Arnstein's work because of the context in which it presents the ladder of participation; it has been specifically suited to underdeveloped countries. This chapter will conclude with a discussion on Key South African institutions that exist to promote public participation.

3.1 Definition of Public Participation

Public participation or citizen participation according to Arnstein (1969) is “the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes to be deliberately included in the future” (p.217). The public participation process creates an opportunity for socio-economically disadvantaged people to make contributions to significant social change that enables them to share in the benefits that the affluent society enjoy (Arnstein 1969). In Bamberger (1987) Samuel describes public participation or community participation as an instrument of empowerment that should lead to an equitable sharing of power between the elite, and disadvantaged or ‘weaker groups’ to increase their political awareness and political influence. According to Choguill (1996) public participation is a mechanism that affords communities the opportunities to influence decisions in the political arena concerning issues that affect them. The ASALGP’s handbook on public participation for local governance defines public participation as “an open, accountable process through which individuals and groups within selected communities can exchange views and influence decision-making” (Devplan.kzntl.gov.za, n.d: 7). According to the ASALGP handbook, public participation is a democratic process that aims to engage people in thinking; deciding, planning. Public participation also allows citizens to play a hands-on role in the development and operation of services that affect their lives” (Devplan.kzntl.gov.za, n.d: 7). Public participation involves a group of procedures that are meant to consult, involve and inform the public, and also to allow those that are affected by a proposed decision to have a say as to whether that decision, or decisions accounts for their best interest or not (Smith 1984).

3.2 Historical origins of Public participation

The idea of decision-making through public participation dates back to the time of the Greek City-States, where participation by all citizens in decision-making was a normal procedure (Rhodes 2007). Direct or participatory democracy was first practiced in ancient Athens (Forje 1999). Two thousand to five thousand people congregated in one place to undertake effective decision-making concerning their needs (Forje 1999). The manner of decision-making during this era is known as direct

or participatory democracy. During the period of direct democracy, citizens without an intermediary, elected or appointed official took part in public decisions (Forje 1999). Citizens had the dual role of “subjects of political authority” and the “creators of public rules and regulations” (Held, 1992: 16). It was the citizens that engaged in legislative and judicial functions, and participated directly in the affairs of the state (Held, 1992). Sovereignty in direct democracies was retained and exercised directly by citizens (Campbell, 2008). Citizens, whether wealthy or poor, even the poorest of the poor, deliberated together to determine the course of public affairs, sharing either by custom, by election, or by lot (Lane, 2011). Although true equality amongst citizens was established and uncompromised in Athenian democracy, barriers of age and sex limited the status of some groups and individuals as citizens (Cunningham, 1972). In Athenian democracy it was only men that were regarded as citizens (Held, 1992: 1989). Women and children were not considered as citizens, and as a result had no active political rights (Just, 2008). Women and children were not allowed to speak or participate in the citizens’ assembly, neither were they allowed to hold any administrative or executive position (Just, 2008). Deliberative democracy is founded upon the belief that democracy is not simply a set of rules, procedures and institutional design (Gaventa, 2006). The principle of deliberative democracy is that its aspect of political participation by citizens cannot be reduced to engagement in the process of electing a representative (Gaventa, 2006). Public participation according to the deliberative democratic view “is a process through which citizens exercise ever-deepening control over decisions, which affect their lives through a number of forms and in a variety of arenas” (Gaventa, 2006: 11).

3.3 Public participation in Neo-liberal Democratic States

The political ideals of Athenian democracy such as equality amongst citizens, liberty and the respect for law and justice, form an integral part of Western political thought (Held, 1992). The Athenian model of public participation differs from that of neo-liberal or liberal representative democracy, in that liberal or neo-liberal democracy promotes the inclusion of women as citizens and active participants in decision-making (Held, 1992). In a representative democracy citizens are required to attend a polling booth where they cast their votes for the candidate that is best suited to represent their interests (Carson & Martin, 2002). The candidate with the most votes

assumes the position of leadership and is expected to represent the interests of the people by articulating and aggregating interests, formulating laws and governing for the benefit of all the citizens (Forje, 1999). Elected representatives attain office in the name of their citizens and are therefore accountable to their citizens for their actions (Carson & Martin, 2002). If representatives do not perform, they risk being voted out of office in upcoming elections (Carson & Martin, 2002). Neo-liberal or representative democracy is different from direct democracy because it aims to justify the sovereign power of the state, and at the same time place limits on the power of the state (Carson & Martin, 2002.) The neo-liberal representative system of governance seems at first glance to be extremely fair because it is founded on the idea of “government of the people, by the people, for the people” (Epstein, 2011: 819; Carson & Martin; 1999). However, Gaventa (2006) notes that in most instances a neoliberal market approach creates a situation where citizens are excluded from having the opportunity to engage in real democratic participation. The exclusion of citizens characterizes the neo-liberal market approach of public participation (Carson & Martin, 1999). This is because these citizens under such political conditions have very little democratic influence over state policies (Carson & Martin, 1999). As a result of this, citizens are not given a chance to exercise real democratic power over the affairs of their state (Gaventa, 2007). This is the worldwide public participation crisis that is evident all in most neo-liberal democratic states around the world.

3.4 Technocratic Participation

Desario & Langton (1984) differentiate between two forms of public participation. These are technocratic scientific bureaucratic decision-making, and democratic decision-making. Desario and Langton (1984) state that public decisions are increasingly becoming influenced by technology. Moreover, experts or technocrats are also becoming a part of decision-making structures both in the public and private sectors. Technocrats are experts that are trained and have experiential knowledge of sophisticated and complex technologies that only a few members of the public may understand. Science and technology are now so complex and technical that it is only mostly specialists can fully understand them (Carson & Martin, 2002). The advantage of this technocratic view is that specialist knowledge is fully deployed both in informing the public and also in the implementation and operation of the technology

(Carson & Martin, 2002). However, when citizens are not properly consulted and informed but told what is going to happen, suspicion arises which leads to mistrust and often times mobilization. Apart from ignorance or lack of expertise amongst citizens, other factors such as attitude, beliefs and motivations of the public affect the public's potential to contribute to complex policy decision-making (Rowe & Frewer, 2000; McCallum & Santos, 1997).

The problem with the technocratic approach of public participation is that it excludes public citizens from being actively involved in decision-making (Rowe & Frewer, 2000). Technocratic decision-making places the decision-making power in the hands of the minority, namely the elected officials, bureaucrats and technology experts (Rowe & Frewer, 2000). Other IAPs and stakeholders are then deprived of their human rights and procedural justice as a result (Rowe & Frewer, 2000). Rowe and Frewer (2000) state that it may not be a sensible idea to include the public in making decisions about highly technical issues, for example the scientific assessment of risk (Rowe & Frewer, 2000). Some citizens today however, with the vast amounts of information that has been made available on social media, are using resources to better inform themselves about scientific technologies, and developments. Other citizens however, having no educational background and computer literacy skills, and lack of access to media related resources cannot inform themselves enough about scientific developments, their benefits and their implications. In the case of the proposed fracking and SGM project in the Karoo, some individuals and NGOs for example have taken it upon themselves to put themselves in a position where they are well informed about the technicalities of fracking and other processes in the lifecycle of SGM and fracking. The benefits of informing one's self, is that there is no dependency on government or oil companies for information, and there is no instance where IOCs or government can spoon-feed biased information for them to readily accept. The second benefit is that upon understanding, citizens will then be able to discern whether a project is feasible for them individually, and communally. In such instance citizens are not restricted and subject to the views of companies, and can oppose development projects in instances where it may not prove sustainable or feasible for them. Some developers often say that development project that they bring to a community will benefit the community and their environment regardless of the

negative impacts that may be attributed to it. Regardless of the economic benefits that a development project may bring, citizens should still be afforded the right to choose whether they would prefer the projects implemented or not. The third benefit of creating awareness amongst citizens is that those that are well informed about the benefits and demerits of a development project are able to then pass on their knowledge to those that do not have access to information.

In our world today there is a greater call for public involvement in the establishment of scientific-based technologies, and the formulation of science and technology policy. The involvement of the public has to be in line with democratic values and methods of public participation, which is to be conducted in a manner that is successful in dealing with issues pertaining to environmental management and health risks (Rowe & Frewer, 2000). Moreover every development project, no matter how technical will always be accompanied by potential social, economic, and environmental impacts that must be disclosed in the best interest of the public. It is for this reason that IAPs should be consulted.

Contrary to Rowe & Freewer (2002), Carson and Martin (2002) contend that decisions about technology are not only about technical matters. Technical decisions may be accompanied by social implications. Desario & Langton (1984) state that the technocracy approach to decision-making often fails to solve social problems, and may contribute to new problems. Technical scientific details of the application or operation of technologies are not a necessity for understanding the crucial social dimensions that hydraulic fracturing may have on the Karoo communities (Doble & Richardson, 1992). Scientific nature of development projects must be simplified and explained with clarity so that the members of the public that do not have access to information, or do not have any educational background are able to understand. It is only when scientific evidence is simplified that this will help to inform the layman of the benefits and shortfalls of a technical development project such as fracking. In the case of hydraulic fracturing, a technology that has been practiced for over sixty years in the USA, lessons can be drawn from the social impacts that SGM and fracking has had on both individuals and communities (Loris, 2012; Miller, 2010). It is from these

experiences of people that one can perceive the social risks the Karoo communities prone to experience if SGE or SGM becomes legalised.

Pure technocratic decision-making takes away the rights of IAPs because the implementation of certain technologies requires a place where these technologies can be stationed. The place in which they are stationed is often a place in which they operate. It is for this reason that the applications of technologies often invade social spaces and transgress the social boundaries of IAPs. This is because some technologies or developments that are implemented near social spaces are often implemented in the absence of correct monitoring procedures.

Whenever a regional or national government make a decision to rezone land or approve a major development, communities stand to be affected both directly and indirectly (Carson & Martin 2002). In the Karoo, farmers' livelihoods are at risk from the detrimental impacts that accompany fracking and SGM. These impacts include water contamination, air pollution, and social disruption from noise impacts. Karoo farmers and Karoo community members are especially reliant on underground aquifers for crop farming and livestock farming (Link TV, 2013). Moreover the dust and noise impacts that are known to accompany truck movements during fracking and SGM are likely to affect the peace of surrounding communities. In the face of proposed fracking and SGM ventures in the Karoo, Karoo communities risk experiencing earthquakes, loss of livelihood and ill health. Thus far it the impacts of fracking are uncertain, as countries around the world are still unsure about the nature of fracking impacts. It is therefore morally ethical that citizens are properly included in all stages of deliberation regarding development projects that can potentially affect their social space.

The technocratic approach to decision-making often occurs in liberal/representative democracies. This is because representative governments retain characteristic features of democratic aristocrats (Manin, 1977). In an aristocracy the ruling elite takes decisions for citizens without any regard for their consent or impute. A representative democracy of such nature allows for the concentration of power, not into the hands of citizens but in the hands of a parliament, and the elected representatives who in some

cases become vulnerable to corruption (Carson & Martin 1999). Carson & Martin (1999) state that in representative democracies, all of the people who stand for election to vote representatives into power must be prepared to enter into a society that will experience a separation between citizens and its elected officials (Carson & Martin, 1999). It is for this reason that representation has come under criticism and has even been rejected by some. Alcott (1999) for example, describes the practice of speaking for others as vain, unethical and politically illegitimate (Alcott, 1991). This is because representatives often find it hard to transcend their own social identities, and also because the oppressed, disadvantaged and marginalized are not given the chance to directly engage with their decision makers (Alcott, 1991). The government, scientific and industrial bodies must therefore pay greater attention to the public and become more accountable and responsive to citizens by involving citizens in policy decision-making processes (Rowe & Frewer 2000).

According to Gaventa (2006) the declining patterns of public participation in the process of representative democracy reveals that public participation no longer has the radical connotations that it once had. Citizens in most neo-liberal representative democracies are having very little influence on the substance of government policies, and this that has led to diminishing trust of citizens in their governments (King, Feltey and Susel 1998). Cooper et al., (1995) states that traditional representative democracies have therefore become dysfunctional, and are unable to satisfactorily respond to the declining levels of public participation in political processes.

3.5 Public participation theories and Degrees of Power distribution

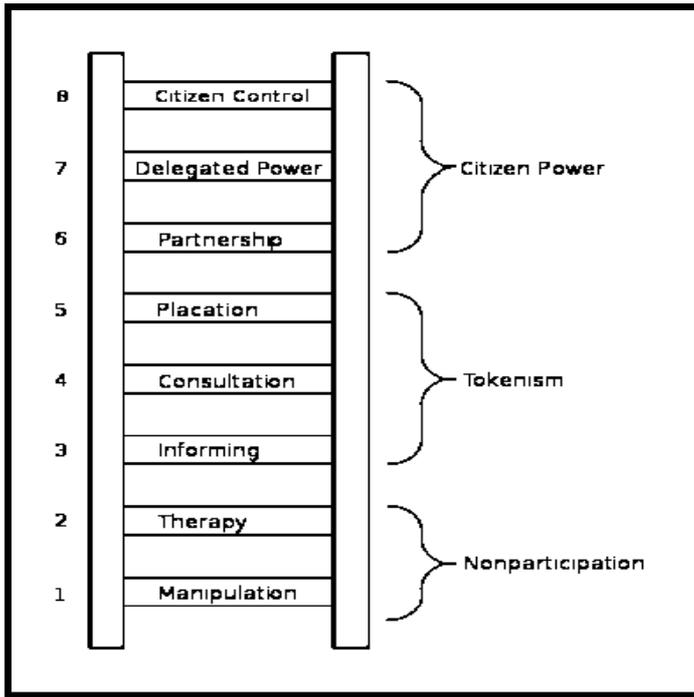


Figure 3: Arnstein's (1969) Eight Rungs on a Ladder of Citizen Participation. Source: Arnstein (1969), p. 217

Arnstein's ladder of citizen participation, illustrated in Figure 3, has been the benchmark for policy makers and practitioners that have sought to enhance public participation (Tritter & MacCallum, 2006). Public participation policies and documents around the world have adopted and incorporated Arnstein's ladder of citizen participation. Arnstein's ladder of citizen participation is therefore the most popular theory of participation when it comes to identifying the various levels of public participation. Arnstein (1969) ladder depicts the different stages of public participation. Each stage reflects the degrees of control that public participants can exercise in seeking to shape the outcome of any decision-making procedure (Arnstein, 1969). These gradations are depicted in the illustration of a ladder that is made up of eight rungs (Arnstein, 1969). These eight rungs are graded from degrees of non-participation, to degrees of tokenism, and to degrees of citizen power (Arnstein, 1969). The theory of the ladder of participation for underdeveloped countries advanced by Choguill (1996) is specifically applicable within the context of

underdeveloped countries. The concept of Choguill's ladder is based on the Arnstein (1969) ladder of participation but with a specific focus on underdeveloped countries.

Arnstein's ladder of citizen participation begins with two non-participatory levels of public participation; these are 'manipulation' and 'therapy' rungs' (Arnstein, 1969; Choguill, 1996). These two levels of participation do not empower citizens in causing them to participate in the genuine planning of development projects or programs (Arnstein, 1969). This level of participation allows decision makers to 'cure' or 'educate' those present at a public meeting (Arnstein, 1969). The terms "educate" and cure suggests a form of participation in which governments and IOC's, after making decisions behind closed doors without the involvement of the public, tell the public what they have already decided to do (Arnstein, 1969).

These levels of public participation that have been discussed thus far consist of a one-way flow of information from officials to the community. These levels of public participation do not allow citizens to give feedback or engage in negotiations with the governments regarding projects that have already been developed (Choguill 1996). In the conspiracy level no participation in the formal decision making process is ever allowed or even considered (Choguill, 1996). These two top-down type initiatives often spark controversy due to the lack of public participation, and the consequences that a decision made by decision-makers might incur (Choguill, 1996). In this level of participation caution is not exercised, and it often leaves poorer groups of a society or community disenfranchised (Rowe and Frewer, 2000).

Further up Arnstein (1969)'s ladder of participation are rungs three (informing) and four (consultation). These levels 'informing' and 'consultation' proceed to a level of tokenism where efforts that are made to conduct public participation are careless and hasty (Arnstein, 1969). Efforts are made to create an impression that public participation is, or was conducted. In such cases only a selected few are used to conduct the public participation process. In these two levels of participation the majority of the public are powerless and cannot ensure that decision-makers take the views of the public into consideration (Arnstein, 1969). Within these levels "there is no follow through, no muscle, and therefore no assurance of changing the status quo of aristocratic democracy (Arnstein, 1969).

Similarly, rungs three and four of Choguill's (1996) ladder are 'conciliation' and 'dissimulation'. Under 'conciliation' similar to, Arnstein's (1969) rung that is labelled as 'informing', public participation is undertaken to appease or stop the public from becoming angry (Choguill 1996). Conciliation occurs when the government devises solutions that are eventually endorsed by the public (Choguill, 1996). Members of the public are not given responsibility or freedom of choice to decide for themselves (Choguill 1996). In this case a government may appoint a few representatives of the community or public to advisory groups, or decision making bodies where they can be heard, but also where they are frequently forced to accept the decisions of a powerful and persuasive elite (Choguill 1996). Choguill (1996) states that the 'dissimulation' level is characterized by participation that is only a façade; a mirage of genuine public participation. People are placed on rubber stamp advisory committees or boards (Choguill, 1996). The aim of this type of participation takes form when decision makers educate the people or more frequently, engineer their support. This form of public participation is also characterized by deception (Choguill, 1996).

Rung five of Arnstein's ladder of citizen participation is referred to as the level of 'Placation' (Arnstein, 1969). This level of public participation is an advanced form of the type of tokenism that is characteristic of the levels of participation in Arnstein (1969) rungs three and four. The only difference is that the grounds rules of placation allow the disadvantaged to give advise concerning a proposed development project (Arnstein, 1969). The only problem is that power holders reserve the right to decide what they feel is right to do in spite of the views and opinions voiced by disadvantaged groups (Arnstein 1969). Diplomacy may take the form of consultation, attitude surveys, public hearings, and visits to the neighbourhood or meetings with local communities (Choguill, 1996). In the event, government officials and IOCs may pretend that they are seeking opinions on a proposed project, or that they are going to support some kind of improvement to the neighbourhood (Choguill, 1996). Royal Dutch Shell, in conducting public participation requirements, inform the public on what is to take place regarding fracking and SGM and what the process would entail (Shell, 2013). Royal Dutch Shells' approach to public participation will be discussed in more detail in the case study chapter. These approaches to public participation

guarantee no assurance that concerns and ideas from the community will be taken into account in these projects, or that support to the community will be provided (Choguill, 1996). This approach to public participation erodes the criteria of true representation where participants should comprise a broad representative sample of the population of the affected public, rather than that of a self-selected subset (Rowe, 2000).

The last three rungs of Arnstein's (1969) ladder of citizen participation reveal more promising forms of genuine participation (Arnstein, 1969). In rungs six for example, citizens are given the freedom to engage in trade-offs with their government (Arnstein, 1969). The seventh rung 'delegated power' occurs where negotiations between citizens and public officials can also result in citizens achieving dominant positions in decision-making authority over a particular plan or program (Arnstein, 1969). In rung eight, (citizen control), the have-not's citizens get the majority of decision-making seats or enjoy the privilege of exercise full managerial power (Arnstein, 1969). Arnstein's level of Citizen Control is synonymous to that of Choguill's highest level of participation 'empowerment', where community members have the majority seats or genuine powers on formal decision-making bodies over a particular project or program (Choguill, 1996). The highest level of citizen participation in both Choguill's and Arnstein's theories describe the strongest form of participation similar to that of public participation in the classical or Athenian democratic era.

3.6 Citizen Mobilisation

The absence of strong levels of public participation leads to citizen mobilization. In democracies where people are taken for granted, much mobilization occurs. When representative leaders, national institutions engage with their citizens on a non-participatory level, the relationship between these becomes tense and uneasy. Citizen mobilization occurs because citizens are empowered to engage in decision-making processes that they may be marginalized from. This marginalization is characterized by a failure of representatives to represent their citizens. It is through mobilization that citizens in most cases obtain rights and justice, and participation in formal governance processes. This shall be discussed in the cases study chapter drawing from

the cases of France and Bulgaria where citizen mobilization against fracking led to a total ban on fracking and SGM.

3.7 The Constitution of The Republic of South Africa and Public Participation Rights

The process of drafting the South African Constitution was largest public participation programme ever carried out in South Africa till date (Sahistory.org.za, 2015). The process of drafting the Constitution consisted of almost two years of intensive consultations. Thus making the Constitution an integration of ideas from ordinary citizens, civil society and political parties represented both in and outside the Constitutional Assembly (Sahistory.org.za, 2015). The Constitution of the Republic of South Africa is the supreme law of South Africa. No other law or government action can supersede its provisions. Moreover, every act, law or conduct that is contrary with the Constitution is considered invalid, and the obligations imposed by it must be fulfilled (Constitution of the Republic of South Africa, 1996).

The Constitution ushered in a democratic regime that brought new freedoms and rights and greatly expanded opportunities for political participation (Mates, 2012). The importance of national and local public participation is embedded in the Constitution of The Republic of South Africa 1996 (Act 108 of 1996). Furthermore, Sections 59, 72 and 118 of the Constitution further mandate both the national and provincial levels of government to facilitate public participation (Constitution of the republic of South Africa, 1996). Section 195 of Chapter 10 (Public Administration) of the Constitution provides that “the public must be encouraged to participate in policy-making” as one of the basic values and principles governing public administration (Constitution of the Republic of South Africa, 1996).

According to section 59 (1) of the Constitution of the republic of South Africa (1996) the public are to have access to and involvement in the National Assembly. This section requires that the national assembly (a) facilitate public involvement in the legislative and other processes of the Assembly and its committees; (b) conduct its business in an open manner, and hold its sittings, and those of its committees, in public, but reasonable measures may be taken (i) to regulate public access, including

access of the media, to the Assembly and its committees; and (ii) to provide for the searching of any person and, where appropriate, the refusal of entry to, or the removal of, any person. Moreover, section 59 (2) of the Constitution states that the national Assembly may not exclude the public, including the media, from a sitting of a committee unless it is reasonable and justifiable to do so in an open and democratic society. These principles are applicable across the national and provincial levels of government

Section 195 of the Constitution of the Republic of South Africa deals with the basic values and principles that govern public administration. According to Section 195 (1) Public administration must be governed by the democratic values and principles enshrined in the Constitution. In this section of the constitution point (a) maintains that a high standard of professional ethics be promoted and maintained. Point (b) states that efficient, economic and effective use of resources must be promoted. According to point (c) public administration must be development-oriented. According to point (d) services must be provided impartially, fairly, equitably and without bias. Point (e) states that people's needs must be responded to, and the public must be encouraged to participate in policy-making. According to point (f) public administration must be accountable. Point (g) states that providing the public with timely, accessible and accurate information, in order to foster transparency. According to point (h) good human-resource management and career-development practices, to maximise human potential, must be cultivated. (i) Public administration must be broadly representative of the South African people, with employment and personnel management practices based on ability, objectivity, fairness, and the need to redress the imbalances of the past to achieve broad representation (Constitution of The Republic of South Africa, 1996). The principles above apply to all spheres of government, organs of the state of South Africa and public enterprises (Constitution of the Republic of South Africa, 1996).

3.8 National Environmental Management Act (NEMA) & Public participation

Public participation in environmental decision-making in South Africa was led through the Consultative National Environmental Policy Process (CONNEPP) in 1995 (Eeu.org.za, 2015). This process brought about the adoption of the National Environmental Management Act (NEMA) in 1998 (Eeu.org.za, 2015). NEMA is a framework law providing overarching principles for sustainable development relating to all development activities in South Africa (Rossouw & Wiseman, 2004: 135). The Environmental Management Act 107 of 1998 (NEMA) comprises many requirements that relate directly to public participation in environmental governance. Regarding public participation NEMA compels decision makers, whether it be government, or the IOCs, to ensure that IAPs, especially those that are vulnerable and disadvantaged, are given the opportunity to engage in environmental decision-making. This principle is echoed in Section 2(4)(f) of NEMA (1998) which states that “ The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured ” (NEMA, 1998).

3.9 Institutions that Promote Public Participation

3.9.1 The Public Service Commission (PSC)

“The PSC is an independent and impartial body mandated by the Constitution, 1996, to enhance excellence in governance within the Public Service by promoting a professional and ethical environment and adding value to a public administration that is accountable, equitable, efficient, effective, corruption-free and responsive to the needs of the people of South Africa” (PSC, 2008). The PSC also upholds the Constitutional principle, which clearly states that “people’s needs must be responded to, and the public must be encouraged to participate in policy making (PSC, 2008).

3.9.2 South African Human Rights Council

The Commission was inaugurated on the 2nd of October 1995 under the Human Rights Commission Act 54 of 1994 and the Constitution of the Republic of South Africa Act 200 of 1993. The South African Human Rights Commission is the national institution that is founded to support constitutional democratic governance in South Africa. The SAHRC is committed to encourage respect for, observance of and defence of human rights for all, without fear or favour (Sahrc.org.za, n.d). The SAHRC recognises the constitution as the highest law in South Africa, and is also mandated to promote respect for human rights and a culture of human rights, promote the protection, development and attainment of human rights and monitor and assess the observance of human rights in South Africa (Sahrc.org.za, n.d)

3.9.3 The Public Protector

The public Protector exists to strengthen constitutional democracy by investigating and rectifying incorrect and prejudicial behaviour, bad management, and abuse of power in state affairs (Pprotect.org, n.d). Values of the Public Protector include independence and impartiality, human dignity, equality, Ubuntu, redress, accountability, integrity, responsiveness, transparency, justice, and Fairness (Pprotect.org, n.d).

3.10 Conclusion

Public participation remains as the mechanism that affords the citizens of democratic states the right to engage in decision-making processes. This process makes it for representative governments and common citizens to collaborate regarding the uptake of development projects. Neo liberal democratic public participation having its roots in Athenian democracy affords citizens to actively engage in political life and influence decisions. As compared to the nature of public participation of the Athenian democracies, the nature of public participation regarding uptake of scientific technologies and development projects of today's neo-liberal democracies remain suspect. Some argue that the reason for disregarding the majority of citizens in decision-making is that they lack the technical knowledge that will allow them to make useful contributions in decision-making. Development projects that are technical in nature however, need the input of the public because of the socio-economic and environmental impacts that may accompany such projects. Fracking is a prime example of such technological development projects. Levels of public participation by Arnstein (1969) in Figure 3 reveals levels of non-participation (manipulation, therapy and informing), where citizens are not represented in decision-making. The levels of citizen empowerment (citizen control delegation power and partnership) depicted in Figure 3 are levels of participation that should be characteristic of all neo-liberal representative democracies, including South Africa. South Africa being a neo-liberal democratic representative democracy requires that its national provincial and local governments uphold principles of transparency, accountability and good governance. In South Africa public participation is mandated by the Constitution of the Republic of South Africa (1996), and upheld in the NEMA. Institutions such as the PSC, the Public Protector and the SAHRC have also been established to ensure that representative leaders do not act in ways that infringe on the rights of South Africans. Citizens of South Africa thus have strong institutional backing that affords them right to participate in meaningful decision-making.

CHAPTER 4: CASE STUDY

4.0 Introduction

Onshore gas explorations are not a new occurrence in South Africa, specifically in the Karoo. During the period of 1965 to 1975 South African energy company Soekor explored for oil and gas in the Karoo (Vermeulen, 2012). Gas was found in the tight shale formations of the Ecca Group of the Karoo Super group, two thousand five hundred, and four thousand meters below the earth's surface (Vermeulen, 2012). Regarding modern day Shale gas ventures, initial estimates recorded that shale gas deposits in the Karoo basin may be as large as four hundred and eighty five tcf (EIA, 2013). Recent estimates indicate that South Africa has three hundred and ninety tcf of shale gas resources (Hedding, Moyer & Rettig, 2013). According to the United States (US) Energy Information Administration (EIA), South Africa currently possesses the eighth largest shale gas reserve in the world (EIA, 2013).

In September 2012 the government of South Africa lifted its moratorium on fracking that had been in place for eighteen months (Franco, Martinez & Feodorff, 2012). From the literature review chapter it has been noted that there have been some dissatisfaction amongst scholars regarding the lack of public participation in the Karoo. Regarding public participation, in the past the South African government suppressed public participation. The nature of public participation in post-apartheid South Africa, according to the constitution, is one that is to be participatory in nature. This chapter provides an insight into the nature of public participation in South Africa with a specific focus on the proposed fracking ventures in the Karoo basin. An in-depth exploration from multiple perspectives, of the complexity and uniqueness of the proposed fracking initiatives, the policies regarding reasons for fracking initiatives, and the nature of public participation the in the Karoo, will be discussed. This chapter also presents a systematic account of public meetings, workshops, and litigation that took place against fracking in the Karoo from the period of 2009 to 2015. These events shed insight on the extent to which different members of the Karoo communities were afforded opportunity to participate in decision-making processes. This chapter shall also discuss initiatives taken by various individuals and Non-

governmental organizations such as the Treasure the Karoo Action group (TKAG), Centre for Environmental Rights (CER) and Wildlife and Environmental Society of South Africa (WESSA), to create awareness amongst interested and affected parties. Such awareness initiatives are most beneficial for South Africans that do not have ready access to media resources regarding fracking and how it might affect them if implemented. Finally, a mini case study of public mobilisation against fracking in France and Bulgaria will conclude the chapter.

4.1 Case Study Methodology

In undertaking this case study documented information on public meetings that have taken place in in the Karoo that deal specifically with the proposed SGM initiatives were obtained from Julienne du Toit's Karoo Space website. Data was also obtained from the websites of non-profit organizations such as the CER, WESSA, WWF and TKAG. The websites of IOCs that have applied for exploration rights to undertake SGM and fracking in the Karoo, such as Royal Dutch Shell was sourced for information regarding the economic benefits, and outcomes that may result from proposed SGM ventures. Other sources that were used to compile this case study include Journal articles, books newspaper articles, and videos from video sharing websites such as YouTube and Vimeo. These sources document the views and opinions of Karoo community members, and other IAPs concerning the proposed shale gas mining project in the Karoo. Information obtained for the mini case study regarding the nature of public participation in Bulgaria include documents that were obtained from the Bulgarian academy of science, and a Bulgarian website Shalegas-bg.eu. A student from the University of Sofia, Bulgaria translated the data from these two sources from Bulgarian to English.

4.2 South Africa

Since 1994 the democratic government of South Africa has been presented with the dual task of alleviating national poverty levels, whilst promoting economic growth through various development initiatives (McIntyre & Gilson, 2000). According to The Reconstruction and Development Programme (1994), attacking poverty and deprivation is to be the first priority of a democratic government (Nelsonmandela.org,

n.d). The Reconstruction and Development Programme (RDP) 1994, openly states that no political democracy can survive and flourish if the majority of its people remain in poverty, without land, and without tangible prospects for a better life (nelsonmandela.org, n.d.). In South Africa unemployment has always been a challenging issue to address, and successful progress in job creation has experienced both increases and fluctuation over the years. In South Africa rates of unemployment increased to 26.4 percent in the first three months of 2015 from 24.3 percent in the precedent quarter (tradingeconomis.com, 2015). This makes it the highest rate since 2005, as unemployment rose 12.8 percent on quarter, while employment grew at a 0.9 percent (trading economics.com, 2015). In the Karoo unemployment is evident and discouraged job seekers look for opportunity to find work to sustain themselves and their families (Shell, 2013).

4.2.1 The National Development Plan (NDP)

In the National Development plan (NDP); a document, which defines a desired destination, and identifies the role that different sectors of society need to play in reaching various national goals, was developed by South Africa's National Planning Commission (NPC) (NPC, 2012). The NDP clearly stipulates national objectives to eliminate poverty, and reduce inequality in South Africa by the year 2030 (Hedden et al., 2013). As stated in the introduction of this thesis, energy is one of the key mechanisms that aids in promoting economic growth and reducing poverty (Times Live, 2010). South Africa's economy is heavily reliant on electricity that predominantly runs on coal-fired power stations (Baker, Newell & Phillips, 2014; Mentor, 2012; Karakezi, 2002). These coal-fired power stations play a major role in meeting most of South Africa's domestic, and industrial energy needs (Mentor, 2012). The National Development Plan (2012) stipulates that the number of South Africans with access to the electricity grid has to increase to ninety percent by the year 2030 (NPC, 2012).

4.2.2 Eskom's energy crisis

A recent report by the US EIA reveals that South Africa has the ninth largest volume of coal reserves in the world (Bohlmann, Bohlmann, & Inglesi-Lotz, 2015; EIA, 2013). South Africa's economy is heavily reliant on an energy sector, which is primarily driven by the mining of coal (Baker, Newell & Phillips, 2014; Karakezi,

2002). Over ninety percent of South Africa's electricity comes from coal, which also accounts for seventy percent of its total energy mix (EIA, 2013). Between the period of 2007 and 2008 South Africa experienced a crisis in electrical energy supply, and demand (Hlongwane, 2012). Blackouts and unplanned load shedding resulted in mine closures across South Africa (Baker, Newell & Phillips, 2014; Hlongwane, 2012). South Africa's energy crisis has also welcomed the interest of SGE in the Karoo (Munro, 2015). As a result of this energy crisis the South African government is looking for alternative ways to meet the increasing energy demands (Franco, 2013). RETs have been implemented in South Africa, however their currently generational capacity is not sufficient to meet South Africa's energy demands. It is suggested that shale gas be obtained to act, as an energy source that will assist in meeting national energy demands while the transition to RETs is in progress.

4.2.3 GHG emission reduction agreements

In September 2000 South Africa adopted the Millennium Development Goals (MDGs). Some of the MDG goals include targets to alleviate poverty, and unemployment by fifty percent, providing skills required by the South African economy (Kearney & Odusola, 2011). In December 2009 President Jacob Zuma made a pledge to lessen South Africa's GHG emissions by thirty four percent by 2020, and forty four percent by 2025 (Baker, Newell & Phillips, 2014). This pledge was in line with South Africa's long term Mitigation Scenario (LTMS) that had been endorsed by Cabinet earlier in 2008 (Baker, Newell & Phillips, 2014).

Currently, South Africa is the fifteenth largest emitter of GHGs in the world (Globalcarbonatlas.org, 2015). On the continent of Africa, South Africa is positioned as the number one CO₂ emitter (Globalatlas.org, 2015). Regarding climate change mitigation, the government is to guarantee environmental sustainability as specified by various local, and international strategic policy inventions to which it is committed. Under the " United Nations Framework on Climate Change (UNFCCC) Kyoto protocol and the Copenhagen Accord, signatories are required to pursue ventures that promote the use of cleaner energy sources to decrease levels of GHG emissions" (Munro, 2015; 27). Currently, about fifty percent of South Africa's GHG emissions are from electricity production, a further twenty percent are from the

metallurgical industry, while ten percent is attributed to the transport sector (Devarajan et al., 2009).

4.2.4 ANC's stance on fracking

The ANC is pro-fracking. In their 2014 Election manifesto they state that “the pace of oil and gas exploration including SGE by the state will be intensified as part of the country’s effort to ensure national self-sufficiency and energy security, whilst promoting environmental sustainability (TKAG, 2014). In November 2013 President Zuma stated, “We are extremely excited about the prospect, because as government we consider hydraulic fracturing for shale gas a 'game-change' opportunity for the Karoo region, and for our economy at large” (News 24, 2013). President Zuma, in two States of the Nation Addresses (SONAs) said that shale gas was to be a game changer. ANC secretary-general Gwede Mantashe, also stated “the Government will forge ahead with contentious projects that will kick-start the stuttering economy even if it is taken to court ” (Prinsloo, 2013). In 2012 Susan Shabangu stated that “the government have acted in the best way possible in the interest of the south African economy and its citizens” (Southafrica.info, 2014). Susan Shabangu also stated that the government had a responsibility to ensure the secure supply of energy was available for South Africa to “explore energy sources that will improve the country's energy mix, grow the economy, and contribute to job creation” (Sanews.gov.za, 2013). Other political parties such as AGANG Ubuntu and FFP are against fracking in South Africa while the African Christian Democratic Party (ACDP) takes a cautious approach to fracking. The Democratic Alliance (DA) is pro fracking but maintains that fracking should proceed with great caution (TKAG, 2014).

4.3 The Karoo

4.3.1 Geographic description

The Karoo is known to be the largest ecosystem in South Africa with an overwhelming scenic iconic landscape, and a habitat to large diversities of both living and non-living organisms (Happy Handgrenade Productions, 2011; 188; Stoyer, 2012). The Karoo region is divided into the Great Karoo and the Small Karoo. The

Great Karoo spreads from the Touws River in the south, to Murraysburg in the northeast (Smit, 2014). The Small Karoo includes the towns of Oudtshoorn, De Rust and Uniondale (Smit, 2014). In terms of geographical size, this semi-arid region is approximately four hundred thousand kilometres (Nel & Hill, 2008). This is approximately forty percent of South Africa's geographic space (Nel & Hill, 2008). The Karoo is also considered to be a single eco-system, sub-divided into the winter rainfall Succulent Karoo and the summer rainfall Nama Karoo (Mucina & Rutherford, 2006; Archer, 2004).

4.3.2 Land Use

Land in the Karoo is used primarily used for extensive livestock farming (Nel & Hill, 2008). The Karoo's main industry is small livestock farming, and crop farming. Regarding crop farming, irrigation agriculture is present along the Orange River, Great Fish River and Sunday River (du Toit, 2013). Specific types of crops that are cultivated in these areas include maize, nut trees, wheat, lucerne, and other fruit trees (du Toit, 2013). The Karoo farming industry in producing over three million sheep annually, export food all around the world (LinkTV, 2013). The Karoo accounts for thirty percent of the country's protein needs in the form of mutton and beef (du Toit, 2013). There are around three million Dorper sheep, used only for meat production in addition to over four million wool-producing sheep, more than a million goats, and a growing number of cattle and wild animals, mostly in the grassier Eastern Karoo (du Toit, 2013). Moreover the Karoo also produces thirteen million kilograms of South Africa's forty four million kilograms of wool (du Toit, 2013). The mohair industry in the Karoo also produces all of South Africa's 2.3 million kilograms of mohair, and accounts for roughly fifty percent of the world's production from about six hundred and sixty eight thousand angora goats (du Toit, 2013).

4.3.3 Water Scarcity

The word Karoo is a Khoisan word meaning, "dry" or "thirst land" gives an idea of the water scarcity that is prevalent in the region that receives about seven to ten inches of rainfall annually (LinkTv, 2013; Warren, 2013). Water scarcity forces the majority of the people in the Karoo to rely on underground water for their daily sustenance since surface water is only available in a few parts of the Karoo (LinkTv, 2013).

Water of the Karoo comes from wells that are drilled into the ground and are pumped to the surface using windmills (LinkTv, 2013).

4.3.4 Historical Karoo gas ventures

During the period of 1965 to 1975, Soekor (Pty) Ltd, which is now known as Petro SA, explored for oil and gas in the Karoo (DMR, 2012; Vermeulen, 2012). Soekor’s exploration results indicate that some reserves of gas were detected in the tight shale formations of the Ecca Group of the Karoo Supergroup, two thousand five hundred, and four thousand metres below the surface of the earth (Vermeulen, 2012). According to the DMR (2012) Soekor's exploration was abandoned in 1979 because there were no real prospects of success with the explorations at the time.

4.4 Present day Karoo Shale gas Ventures

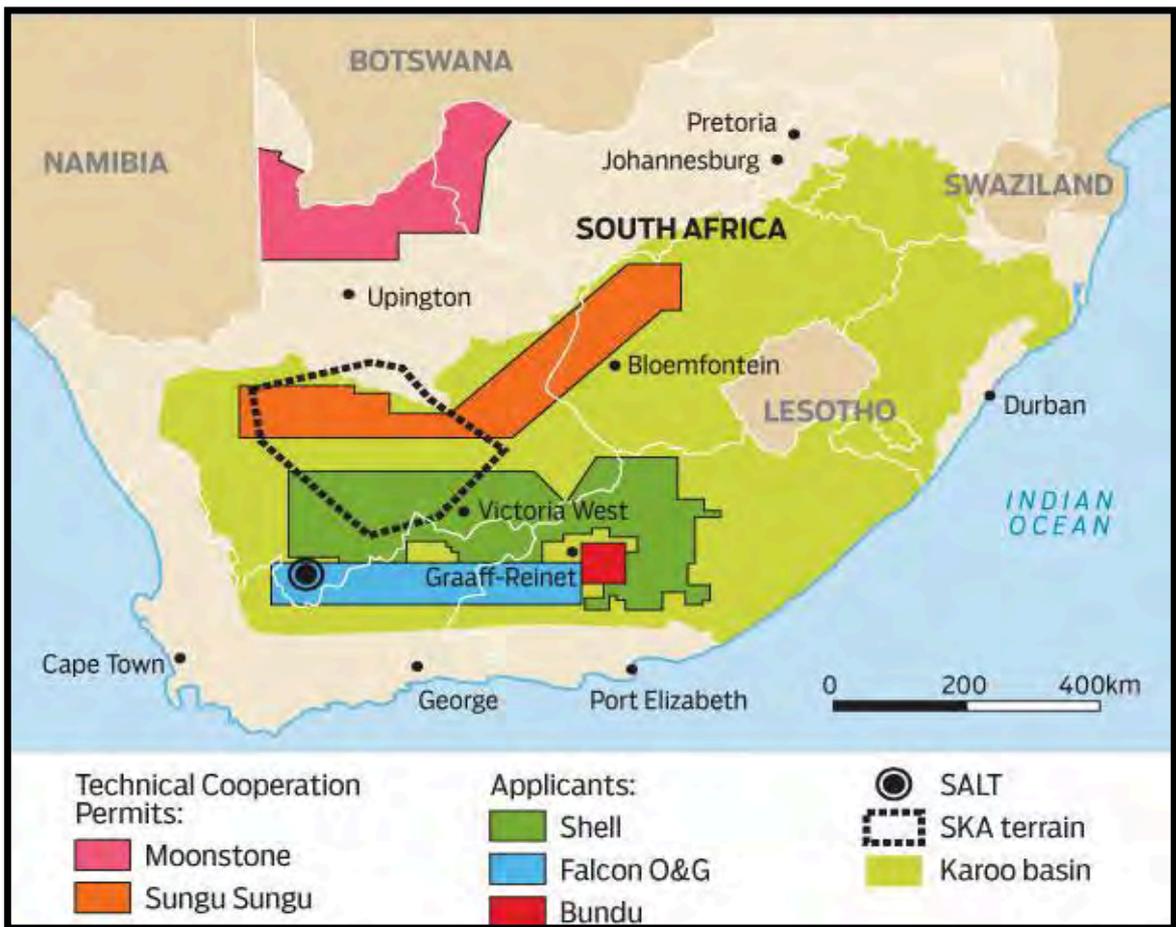


Figure 4: Applications for SGE in the Karoo basin. *Source: du Toit, 2014*

4.4.1 Applications for Exploration

In 2009 Petroleum Agency South Africa (PASA) gave consent to Shell to conduct an assessment of potential shale gas reserves in the Karoo Basin (Econometrix, 2012). It was then in December 2010 that Shell submitted three separate exploration license applications for areas of around thirty thousand square kilometres each (Dittrick, 2013). These areas lie in the Western Cape, Eastern Cape and Northern Cape provinces (Dittrick, 2013; Infield Energy Analysts, 2013). Royal Dutch Shell applied for exploration licenses, with an allocated exploration area of ninety thousand Kilometres square; Bundu Gas & Oil Exploration applied for an allocated exploration area of three thousand one hundred square Kilometres, and Falcon Oil & Gas applied for an allocated exploration area of thirty thousand square Kilometres (Fig, 2012; Infield Energy Analysts, 2013). Figure 4 gives an illustration of the proposed areas that have been applied for by Shell, Falcon, and Bundu to conduct SGE (du Toit, 2014).

4.4.2 Initial Local Public Opposition to Fracking

In response to the applications for fracking and the shale gas ventures in the Karoo, in 2011, Interested and Affected parties and local community residents were very forthright about their disapproval of proposed plans to frack for shale gas in the Karoo. It was this opposition that led to the declaration of a moratorium on all exploration license applications at a Cabinet meeting in April 2011 (Temper et al., 2013). A ministerial task team was then appointed to conduct feasibility studies on the full effects, and implications of fracking before the finalisation of the pending applications made by Royal Dutch Shell, Falcon Oil and Gas, and Bundu Gas (Temper et al., 2013). In September 2011 the moratorium was extended for a further six months to allow the task team to complete their feasibility studies (Van Wyk 2014).

4.4.3 Ministerial task team conducts studies on fracking

The appointed task teams feasibility studies on fracking included a study and evaluation of the perceived environmental risks posed by the process of fracking, including the negative and positive social and economic impacts of SGM (DMR, 2012). According to the DMR, the working group of the task team on Shale Gas and

Hydraulic Fracturing was chaired by the CEO of Petroleum Agency SA, and comprised representatives from the following departments and institutions: Departments of Environmental Affairs and Water Affairs, Science and Technology, Energy, Mineral Resources, the Petroleum Agency of South Africa, Council for Geoscience, SKA South Africa, Water Research Commission, and Eskom (DMR, 2012). Representatives from the Department of Agriculture, Environmental Affairs, Health, Tourism and water ministries were not included as part of the ministerial task team (Franco, 2013). The ministerial task team however, did not include representatives from the Departments of Agriculture, Environment, Health, Tourism, and water ministries (Fig 2012; Franco Martinez & Feodorf, 2013).

4.4.4 The First Country to Reverse a Moratorium

In September 2012, Susan Shabangu, Minister of Mineral Resources, Godfrey Oliphant, Deputy Minister of Mineral Resources, and Thibedi Ramontja, Director General informed the media about governments decision to lift the moratorium on fracking (Smit, 2014). In this briefing with the media, Minister Susan Shabangu stated the following. “ It took us over one year for us to conclude this process and we are satisfied that we’ve given sufficient time for us to consider the matter of hydraulic fracturing, and the report presented indeed, and taken to cabinet informed the cabinet on the decision which they have made” (The Real News, 2012). It was in September 2012 the South African national government lifted the moratorium on applications to explore for shale gas (Smit, 2014; Warren, 2013).

4.4.5 Fight Against Fracking In The Karoo

The revoking of the moratorium made it possible for the DMR to consider and decide on applications for exploration for shale gas in the Karoo basin. Since then, fracking has not gone without immense opposition especially from community members and farmers in the Karoo, who are engaged in a fierce litigation process against fracking. In the same Media briefing Jonathan Deal, Chairman of the TKAG stated that they were very perplexed by the lifting of the moratorium on fracking, and that they would proceed to take the matter to court as time unfolded. Outside the national Parliament in Cape Town, anti-fracking activists chanted against the decision of the government

to lift the moratorium (The Real News, 2012). The protest was part of the global frackdown anti-fracking campaign.

4.4.6 Farmers Against fracking

Farmers in the Karoo are very threatened by proposed shale gas ventures in the Karoo. This is mainly because of the water aspect since water is considered the life-blood of the Karoo (Happy Handgrenade Productions, 2011). Ninety percent of water in the Karoo comes from underground aquifers and if polluted, the livelihood of farmers and other community members alike risk great hindrance. In the Happy Handgrenade documentary, a farmer stated... “If our underground water is contaminated, it is like cutting our life-blood basically” (Happy Handgrenade Productions, 2011). In voicing her opinion on the presence of Multi-national oil companies’ fracking in the Karoo, another local member of the Karoo had the following to say regarding Shell. In the same documentary another lady from the Karoo said... “We don’t need them here, we don’t want their money, we don’t want any promises that they make” (Happy Handgrenade Productions, 2011).

4.4.6.1 Farmer Ogilvie

Farmer Dickie Ogilvie, one of three thousand farmers that live in the Karoo has also joined the campaign against fracking (Caboz, 2015). Farmer Dickie Ogilvie resigned from his teaching job to help his wife run her brother’s farm, Doorndraai, which is located one hundred kilometres south west of Graaff Reinet. Dickie Ogilvie’s biggest concern is that fracking ventures will destroy their livelihood if implemented (CNBCAfrica, 2014). Farmer Ogilvie stated, “ these guys do not believe that if something goes wrong, once water has been contaminated it is over, we will have to move off ” (CNBCAfrica, 2014). Furthermore Dickie Ogilvie said that apart from farms, communities in towns such as Aberdeen and Graaf Reniet were also reliant on underground water (CNBCAfrica, 2014). Another major worry for Farmer Dickie Ogilvie was the fact that there was so much uncertainty regarding fracking (CNBCAfrica, 2014). Dickie Ogilvie also stated that minute that these licenses are issues the IOCs will carry on with what they want to do. Dickie also said that the process would be challenged through Jonathan Deal and Derek Light. Contributing toward the fight against fracking, Dickie Ogilvie pledges three rands for every hectare on his fourteen thousand hectare farm, which is a contribution towards the fight

against fracking in court (Caboz, 2015; CNBCAfrica, 2014). Other farmers in the Karoo have also pledged towards fighting against fracking (CNBCAfrica, 2014).

4.4.7 Derek Light Attorneys

Farmers and community members are engaged in a fierce legal fight against Shell, Falcon and Bundu (CNBCAfrica, 2014). The legal fight against fracking in the Karoo has been through Derek Light Attorneys who have been dealing with fracking for just over three years (CNBCAfrica, 2014). Derek Light represents hundreds of Karoo landowners and communities. In the CNBCAfrica (2014) documentary Derek Light stated that all that happened with the decision to implement fracking in the Karoo occurred without any prior consultations from the government. He also stated that at any consultations that are to be held by the government would be too late. This was because the government had already made decisions, and formulated and passed amendment acts without any prior consultation, which Derek Light said, was sad (CNBCAfrica, 2014). Derek Light also stated that one of the objections that they had to the environmental management plans of the IOCs is that they failed to establish base-line information necessary for the establishment of fracking risks and impacts and the management of those risks (CNBCAfrica, 2014). According to Derek Light, the biggest concern that people in the Karoo have concerning fracking is the fact that it will contaminate the Karoo under ground water (CNBCAfrica, 2014). In the documentary it was further stated that the Eastern Cape Government have made funding available to the Nelson Mandela metropolitan university in Port Elizabeth to conduct base line assessments of ground water in the Karoo aimed at informing provincial government better to facilitate proper decision making (CNBCAfrica, 2014). Furthermore Derek Light said that baseline studies would take between two to three years to complete. Moreover, Derek Light also stated that the South Africa's department of minerals expected fracking to start as early as mid 2016 (CNBCAfrica, 2014).

4.5 NGO's Involvement in Public Awareness Initiatives

many marginalized residents of poor rural Karoo communities are isolated from partaking in the fracking debate (Temper et al., 2013: 106). The majority of these Karoo residents have very little or no means of accessing information about fracking and SGM. It is for this reason that NGO's and other Anti-fracking groups have

voluntarily assumed the responsibilities of creating awareness of fracking and SGM amongst members of the public. The Anti-fracking groups are Treasure the Karoo Action Group (TKAG), World Wildlife Fund (WWF) and the Centre for Environmental Rights (CER). These Anti-fracking, groups, having access to wealth of information from abroad, through links and first hand experience of fracking and its impacts, create public awareness through the screenings of documentaries, workshops, printing and distribution of information fliers. Centre for Environmental Rights (CER) and Wildlife and Environmental Society of South Africa (WESSA) have conducted a series of workshops in parts of the Karoo (Temper et al., 2013: 107).

4.5.1 Treasure the Karoo Action Group (TKAG) & AfriForum

The Treasure the Karoo Action Group (TKAG) is a small Non-profit organization that was founded in 2011 by Jonathan Deal. Jonathan Deal found out about fracking in 2011 when the billionaire Johan Rupert spoke out against fracking. Jonathan Deal felt that fracking was something that was to be investigated so he started studying fracking and began attending Shell public meetings (CNBCAfrica, 2014). Thus far Jonathan Deal has been involved in debates against fracking including a debate with President Barack Obama. Jonathan Deal has played an instrumental role in writing letters to the presidency, public protector and IOCs companies, strongly urging them to reconsider implementing fracking in South Africa in its current form (CBNCAfrica, 2014).

Jonathan Deals view regarding fracking is that South Africa is not ready to deal with the implementation of fracking from a legislative, scientific, technological and socio-economic viewpoint (CNBCAfrica, 2014). The TKAG endeavours to create awareness, advocacy and accountability around the issue of SGM in South Africa. The Treasure the Karoo Action Group (TKAG) has three main objectives. Firstly, they aim to maintain expert and current knowledge on international developments regarding fracking (Treasurethekaroo.co.za, 2011). Secondly, the TKAG uses public forums, the media, and printed material to inform the public about the facts of fracking (Treasurethekaroo.co.za, 2011). Thirdly, the TKAG use every legal means at their disposal, including litigation to protect the people and the environment of South Africa in accordance to the principles in the constitution of the republic of South

Africa (Treasurethekaroo.co.za, 2011). The TKAG has forged an alliance with AfriForum,

4.5.2 TKAG creates fracking awareness Through Music

TKAG in collaboration with a hip-hop artist Jitsvinger produced an animated music video as part of their campaign to create awareness about fracking, and why its implementations in South Africa should be re-considered (Treasurethekaroo.co.za, 2011a). The video was mainly aimed at youth audiences who, according to Jonathan Deal, stand to be most affected from fracking (Treasurethekaroo.co.za, 2011a).

4.5.3 TKAG Sues Minister Shabangu

When the Department of Minerals concealed information about the Task Team, the TKAG invoked the Promotion of Access to Information Act (PAIA), to obtain information about the task team that was appointed, along with the report that the task team submitted to Cabinet (Treasurethekaroo.co.za, 2011b). At the time, the TKAG called for Terms of reference and/or instructions relating to the research that was to be undertaken by the appointed task team on fracking (Treasurethekaroo.co.za, 2011b). Information pertaining to the identities and qualifications of the individual task team members, the minutes of all task team meetings, a copy of the most recent version of the task team's report, and also, all the research documents that relate to hydraulic fracturing and which have been, or may be, used by the task team (Treasurethekaroo.co.za, 2011b). The minister failing to provide these documents was sued in October 2011, with the Northern Gauteng high court ruling in the favour of the TKAG (Temper et al., 2013).

4.5.4 TKAG Meeting with DMR

In August 2014 representatives from the TKAG, AfriForum and IFAISA were invited to attend a meeting with a high delegation from the DMR to discuss issues pertaining to SGM and fracking (Prinsloo, 2014). The meeting was called two weeks after the TKAG had written a letter to President Jacob Zuma requesting him to reinstate the moratorium on fracking (Planting, 2015; Prinsloo, 2014).

4.5.5 Critiques of the Budget Speech

It was disclosed in February 2015, by finance Minister Nhlanhla Nene, that one hundred and eight million rands has been set aside to conduct research and regulatory requirements for increasing SGE (Parliament of the Republic of South Africa, 2015; Mining Weekly, 2015). Jonathan Deal stated that the TKAG would be writing to the minister to investigate the nature of the budget that the money allocated to fracking was allotted for (Treasurethekaroo.co.za, 2015a). Deal also stated that this was to be done to ensure that money spent should be to address the fundamental issues that have characterized the discourse on SGM (TKAG, 2015a). Moreover, Jonathan Deal said that this was to also prevent a waste of taxpayers' money (Treasurethekaroo.co.za, 2015a).

4.6 Centre for Environmental Rights (CER)

The CER is another non-profit organisation and a law clinic based in Cape Town South Africa. The CER envisions a South Africa where every person's Constitutional right to an environment that is not harmful to health or well being, and to have the environment protected for future generations, is fully realised. In anticipation of the Minister of Mineral Resources' decision on exploration licenses for shale gas fracking in the Karoo basin, the Centre for Environmental Rights calls for accountable and transparent decision-making that takes into account the environmental, and other rights of all South Africans, including, in particular, disadvantaged and vulnerable communities in the Karoo. Such accountable and transparent decision-making would require, at least, the publication of the expert task team report, as well as public hearings on this controversial issue. The Centre also outlines minimum requirements for the task team report in terms of local and international research and experience, and sets out strict requirements for the proper regulation of shale gas fracking.

4.7 The Wildlife and Environment Society of South Africa (WESSA)

In 2012, WESSA position on fracking moratorium was that it did not support the lifting of the moratorium on fracking by the DMR (WESSA, 2012). Lack of transparency and accountability was amongst various reasons given by WESSA for their opposition of the lifting of the moratorium. WESSA (2012) stated that in the reversal of the moratorium most communities had not had reasonable opportunity to

participate in a fully disclosed environmental impact assessment process. Furthermore, WESSA requested a full disclosure of the ministerial Technical task teams report on fracking (WESSA, 2012). WESSA recommended that the national government address and present opportunity for IAPs to engage in public participation processes prior to decision making around prospecting and eventually, extraction of shale gas (WESSA, 2012).

Between May and June 2011, the CER and WESSA led a series of community workshops in the Karoo where two hundred and thirty four representatives attended (CER, 2013). The workshops were conducted across seventeen different towns and took place from 30 May to 5 June 2011 in Calvinia Williston, Sutherland, Fraserburg, Carnarvon, Beaufort West, Victoria West, Murraysburg, Richmond and Middelburg, and on 21-26 June 2011 in Graaf-Reinet, Pearston, Somerset East, Cookhouse, Bedford, Adelaide and Cradock (CER, 2011). According to the CER out of the two hundred and thirty four representatives that attended the CER/WESSA workshops, only thirty-four delegates had attended the public participation meetings that were by Shell (CER, 2014). It was also noted that Shell had only covered ten out of seventeen of these towns in the Karoo (CER, 2011). These towns were Middleburg, Sutherland, Calvinia, Somerset East, Cradock, Murraysburg, Williston, Beaufort West and Graaff-Reinet, Victoria West (CER, 2011). Only twenty four percent of those that attended the public meeting had any prior knowledge of shale gas applications having been submitted to PASA (CER, 2013). Findings from the joint workshop reveal that disadvantaged communities in the Karoo were in serious need of further consultation (CER, 2013). Efforts are required explaining to disadvantaged because they would not understand the contents of Shells draft Environmental Management Plan (EMP) without assistance. CER and WESSA expressed their concerns that the affected communities of the Karoo were excluded from the participation processes that was recognised as a violation of their rights under the constitution of South Africa (CER, 2013).

4.8 World Wildlife Fund (WWF) SA

In 2015 The WWF released a technical report titled “ Framework to Assess the Reality of Shale Gas in South Africa” (WWF, 2015). The WWF stated that fracking, at this time, is not a commercially viable venture for South Africa to pursue

(HeraldLIVE, 2015). According to WESSA's technical report, South African oil and gas plays, especially shale gas, currently suffer from a trust deficit (WWF, 2015). The trust deficit exists because the integrity and accountability measures are not substantial enough for the public. This is due to the prevalent corruption and political scandals that have received media attention in South Africa (WWF, 2015). The technical report compiled by WWF (2015) also discloses the shortcomings of the Econometrix study that was commissioned by Shell. WWF (2011) stated that Shells Econometrix study failed to grapple with issues of inequality and redistribution under South Africa's current political economy. Moreover, the Econometrix report also assumes entitlements are automatic, and seamless between the exploitation of resources and the way revenues are appropriated and accrued within a given economy (WWF, 2015). The Econometrix report, published in March 2013 suggests that the development of shale gas could ensure South Africa's energy secure future; create permanent and sustainable Jobs, increased government revenues and a boost in the Nations Gross Domestic Product (Econometrix, 2012).

4.9 Shell, Falcon and Bundu Public participation initiatives

Shell, Falcon oil and gas and Bundu, have been in the process of engaging in consultations with affected communities in the Karoo as part of the requirement mandated by NEMA. Treasure Karoo Action Group (TKAG) director of operations Jeanie Le Roux stated that many people as possible should attend the public meetings in order to be informed, and also to take the opportunity to voice their concerns regarding fracking (Preller, 2015).

4.9.1 Shell Public Meetings

Since 2009 Shell has been at the forefront of particularly interested in gaining exploration rights in the Karoo (de Wit 2011: 3). Shell has conducted extensive public participation meetings and house visits in the Western, Eastern and Central precincts of the Karoo (Golder & Associates, 2011). The proceedings of the meetings have been collated in the form of a public participation report. This report contains all of the issues raised by stakeholders, verbally, in writing, email or fax, post, and telephonically. Some of the key, concerns voiced in the public meetings are summarised below.

Concerns were communicated regarding the potential destruction of the landscape of the Karoo will be both physically and visually (Golder & Associates, 2011). Concerns that compensation of the destruction of the Karoo could not repair the environment citing the well know fracking documentary “ Gasland” (Miller, 2014; Golder & Associates, 2011). Concern that the prospecting of natural gas in the Karoo would not be viable due to the water insufficiency in the Karoo, and the fact that the water available would not be sufficient to accommodate the Karoo locals and the non-local workers that may man the fracking operations in the Karoo (Golder & Associates, 2011). In the meeting concerns of the impacts that fracking could have on the livelihood of farmers in the Karoo were voiced (Golder & Associates, 2011). In a Focus group meeting members of the South African Heritage Resource Agency pointed out that the richness of the Karoo in paleontological heritage, should require that a palaeontologist be included in the Study of the EIA shell was to conduct (Golder & Associates, 2011). In another focus group meeting Elias Barnard and Adriaan Esterhuysen of the Sutherland Farmers Union voiced their concerns that shale gas ventures could destroy the quiet, cultural value, the Ecosystem, the sense of the place (Golder & Associates, 2011).

A public meeting held in Cape Town a participant expressed his concern of the air and water impacts fracking would have (Golder & Associates, 2011). In a public meeting in Sutherland Julie Meswati and a farmer of Wilgerboskloof by the name of Adriaan Esterhuisen questioned shell on how their proposed fracking initiatives would be considered in their Environmental Management Plan in correlation to the SKA Astronomy project (Golder & Associates, 2011). Shell responded to this question, stating that the astronomy groups were being consulted to obtain an adequate understanding of their requirements. Regarding the Astronomy project, Debie Morkel, a participant questioned Shell on the fact that the at no point would it be legally possibly for the applicant to execute exploration drilling or production in the Western Precinct without violating Astronomy Geographic Advantage Act (page 29-30) a, b, and c (Golder & Associates, 2011). A member of the Square Kilometre Array (SKA) project at an SKA meeting with Shell, stated that the SKA were concerned about three exploration related activities which could be potential disturbances to the SKA project (Golder & Associates, 2011). These included seismic

disturbances, emission of broadband interferences from petrol vehicles, machinery, generators, welding, and wireless communication systems (Golder and Associates, 2011). Adrian Tiplady also stated that they expected Shell to adhere to the requirements of the Astronomy Advantage Act, particularly in terms of buffer zones. Another participant also stated that Light and dust pollution generated from fracking would serve as a potential hindrance to the SKA project (Golder & Associates, 2011).

In a public meeting in Calvinia, Erwin Coetzee, a Farmer of Tonteldoosfontein pointed out that in the 1960's Soekor drilled a borehole on his farm. He also stated that till this day the area that was drilled had not been rehabilitated. He stated that in the Karoo rehabilitation of Land did not take only fifty years due to the sensitive nature of the Karoo environment (Shell, 2011). In another Public meeting in Wilston another farmer raised the topic of the sensitive nature of the Karoo environment, stating that rehabilitation would be a serious issue since vegetation that was destroyed during a road construction in his area forty years ago had not revived since that time (Shell, 2011).

A video documentary by Shell titled “ Exploring the Karoo” documents the widespread fears that the Karoo farming community (Shell, 2013). Better inform the locals and allay concerns about fracking (Shell, 2013). In the documentary Isaac Grobellaar expressed that farmers are extremely reliant on underground water reserves (Shell, 2013). The Karoo was made over millions of years, and you are going to mess it up in one day. Those who don't have anything, they want this project so much (Shell, 2013). Meetings at remote farms take time. Izak Grobbelaar stated that although was still not at ease regarding fracking having information is better. Findings from public consultations with Karoo communities reveal that most of the people that were afraid of the unknown (Shell, 2013). Shells also hold public meetings to ensure that local communities are updated but given the chance to air their views. Farmers are concerned about the future of their children (Shell, 2013).

“ The majority of the Population are poor and in urban townships unemployment is about eighty percent” (Shell, 2013). Many of the poor are happy about the economic investment that Shell is offering from proposed fracking ventures (Shell, 2013). A member of the Karoo community stated, “ I am very happy because I think there will

be Job opportunities instead of people resorting to robbery and house breakings” (Shell, 2013). According to SABC Digital News (2015) Shell stated that they had put their shale gas initiatives in the Karoo on hold. Shells reason for abandoning fracking in the Karoo was due to the regulatory uncertainty. Bonang Mohale stated that Shell had been waiting for six years for the licenses to explore for shale gas in South Africa (SABC Digital News, 2015). Another reason that was given was the decline in global oil prices.

4.9.2 Falcon Oil & Gas Public Meetings

In 2010 Falcon submitted applications to explore thirty thousand, three hundred and fifty kilometres of the Karoo basin (groundwork, 2014). In 2012 Falcon made an agreement with U.S based oil company Chevron to co-operate for five years in exploiting shale gas in its allocated portion of the Karoo (groundwork, 2014: 6). A heated public meeting in February in Aberdeen facilitated by Falcon Oil and Gas, and SRK was very heated (du Toit, 2015a). CEO of Falcon Oil & Gas, Philip O’ Quigley briefed the ninety attendees, of Falcons plan to conduct seismic testing in the Karoo using dynamite (du Toit, 2015a). From the meeting it was concluded that people in the Karoo were very much opposed to Falcons intentions to undertake their seismic testing in the Karoo.

One farmer had the following to say regarding the seismic testing... “You didn’t ask if it was all right to come here. You made up the rules. Who will give you permission to come on my land? I can give you the answer now. No, you may not enter! My gates are locked. And don’t come with any helicopters, because my shotgun will be loaded.” (du Toit, 2015a) O’ Quigley also stated that the phase of seismic surveying was to cost a billion rand (du Toit, 2015a). At one point in the meeting a Landowner by the name of Pieter Jordaan said, “we are not idiots, and we are not happy with this. Where will the precise lines for the surveys be? If things go wrong, who will compensate, and who will handle claims?” (du Toit, 2015a)

Falcon Oil & Gas held another public meeting in Jannesville in February 2015 (du Toit, 2015b). Falcon Oil & Gas and SRK consultants wanted to brief the public of their plans to conduct seismic testing which involved planting a kilogram of dynamite

every fifty meters, over one thousand kilometres in the southern part of the Karoo, over a route that had not yet been finalized (du Toit, 2015a). The seismic testing was to determine whether the quantity of shale gas in the Karoo is commercially viable for exploitation (Preller, 2015). This public meeting was a heated one with the members of the public opposed to the seismic testing and fracking (Preller, 2015).

4.9.3 Bundu Public Meetings

On the 13 February 2015, Bundu Oil & Gas, which is owned by challenger Energy, conducted a public meeting in the small town of the Karoo called Pearston (du Toit, 2015c). Those that attended the meeting included Golder Associates, Farmers, TKAG, Derek Light, and members of the media (du Toit, 2015c). From the meeting it was clear that the first two phases of would generate very limited jobs, since the drilling Jobs would require its own rig crew (du Toit, 2015c). The former Mayor of Pearston had the following to say regarding a misunderstanding of job creation by fracking amongst the Pearston community, “I think there has been a misunderstanding about job creation. The people here think they are going to get rich and that there will be permanent jobs. That is not going to happen” (du Toit, 2015c). Daantjie Japhta, a former mayor (of Graaff-Reinet) and head of the Khoi’s Inqua nation expressed his views about fracking in the Karoo (du Toit, 2015c). He stated that the indigenous people continue to remain opposed to fracking since 2013 (du Toit, 2015c). His reason for the opposition from the indigenous people was due to the lack of public consultation. He stated that there could be no drilling if the first indigenous people of the Karoo are not consulted (du Toit, 2015c). Moreover, Daantjie Japhta stated that the farming and tourism economy were going to be destroyed. He questioned what was to happen to the people that would lose jobs in these two main sectors of employment as a result of fracking (du Toit, 2015c). Daantjie Japhta was very vocal about his displeasure of the fact that ninety five percent stake in the Karoo venture while its South African Subsidiary, Bundu, had only five percent. Princess Jean Burgess, chief of the Gonaqua Khoi people emphasized the sensitivity of the land issue, she stated that opposition against fracking was not a case that had to do with private ownership of the land, but also the destruction of culture, language and their very being (du Toit, 2015c). A portion of the community members of Pearston were displeased with princess Jean Burgess’

statement and grumbled when said that there would be no significant job created for locals if fracking was to take place (du Toit, 2015c).

Karoo community members that were in favour of fracking were present at this public meeting, and were also given the opportunity to voice their opinions. Jersey Charlie, an ANC stalwart and religious leader stated, “I was born here in Pearston in 1947 and grew up here (du Toit, 2015c). “ In 1985 I was arrested and sent to prison by the Apartheid government... we are suffering here. We are going to stand together and hope there is gas (du Toit, 2015). The gas exploration must go on” (du Toit, 2015c). Jersey Charlie proceeded to say that those that did not want Bundu in the Karoo were those who were rich. Moreover, in favour of fracking in the Karoo, Jersey Charlie said, “we say Bundu must come (du Toit, 2015c). Bundu, no one can stop you. The oil is there. The gas is there. The people must have all this. Stop pushing us down!” (du Toit, 2015c). In the Karoo some developers and local community residents, especially in the rural areas perceive fracking to be the last hope for job creation in the Karoo (Botha & Yelland, 2012).

4.10 EC Government Consultation In the Karoo

A stakeholders meeting was held in Graaf Reniet where the premier of the Eastern Cape (EC) Sakhumi Somyo addressed the attendees of the meeting (du Toit, 2014). The premier of the EC stated that According to Somyo, this meeting was the beginning of consultation with Karoo communities regarding fracking and SGE initiatives in the Karoo (du Toit, 2014). According to du Toit, during this meeting forty minutes was allocated to questions and opinions and only twelve people were permitted to speak (du Toit, 2014). The EC politicians at the meeting answered none of the questions that were asked by the people (du Toit, 2014). Derek Light was displeased with the fact that the meeting had come six years later (du Toit, 2014). Other were displeased and stated that the EC politicians were not at the meeting to consult the people, and that the decisions that were made to proceed with fracking were not made by people from the Karoo (du Toit, 2014). Furthermore Kenneth Bowkers Waterboer, chief of the Waterboer Clan and Relevant Griquas, a self-confessed proponent of fracking stated that since the ANC was going ahead with

plans to frack the Karoo, the stakeholder meeting was not one that was consultative in nature (du Toit, 2014).

4.11 Fracking SGE Policy Development

4.11.1 Amendments to the MPRDA

In January 2015 President Zuma stated that the MPRDA lacked constitutional muster and sent the MPRDA back to parliament (Business Day Live, 2015). According to President Zuma, the MPRDA conflicted with international agreements such as the General Agreement on Tariffs and Trade (GATT), and the Trade, Development and Co-operation Agreement (Business Day Live, 2015). Another reason that the MPRDA lacked constitutional muster was that, the National Conference of Parties (NCOP) failed to facilitate public involvement whilst processing it (Miningweekly.com, 2015). According to President Zuma, "...the consultation period was highly compressed, and there appears to be insufficient notice of the public hearings held by the provincial legislatures" (Business Day Live, 2015). The MPRDA was also flawed because it was also not referred to the house of traditional leaders for their comments (Business Day Live, 2015).

4.11.2 Development of Environmental Impact assessments (EIA) on SGM

In South Africa all new development projects an EIA has to be conducted before they are allowed to take place (Scholvin, 2015) An EIA is a tool that serves to determine and evaluate the environmental impacts of a development project by informing decision-making at the stages of practically undertaking a development project (Netshishivhe, 2014). Although there is some evidence of positive and negative impacts of fracking, there is currently a lack of clear assessment on the environmental impacts of fracking in the South African context. According to Forde (2014) it is only when exploratory fracking yields promising results that the EIA process would take place. Currently no EIAs have been finalised by Shell, Falcon, or Bundu. According to a report titled “Shell Don’t Frack The Karoo” commissioned by groundWork (Friends of the Earth South Africa, Southern Cape Land Committee and Milieudefensie (Friends of the Earth Netherlands), EIAs may sometimes not be enough to address extensive impacts of a development project, since EIAs are site-specific (Peek, Lewis & Teuling, 2014). The impacts of fracking in the Karoo for example, may not be restricted to the specific project sites in which the fracking may be undertaken. A project such as fracking is likely to impact on areas outside of its project site, and the best course of action to ensure compliance with international standards, would be to undertake a Strategic Environmental Assessment (SEA) (Peek, Lewis & Teuling, 2014).

4.11.3 Launch of SEA by DEA

In May 2015 the Minister of Environmental Affairs launched a Strategic environmental Assessment (SEA) on fracking and SGM. Collaborating to undertake the SEA includes the Department of Water and Sanitation (DWS), Department of Science and Technology (DST), Department of Energy, DMR (DMR) and the Centre for Scientific and Industrial Research (CSIR), and South African National Biodiversity Institute (SANBI) (environment.gov.za). The SEA is a study that would aid in informing the South African government on the best course of action to take regarding SGE and fracking from a scientific perspective (TKAG, 2015; environment.gov.za, 2015). The SEA will help to determine the environmental implications of policies, plans and programmes. The commissioning of the SEA aims

to address important issues and concerns around SGM in South Africa.

According to environment.gov.za (2015) the significance of the SEA project aims to ensure a governance structure and approach that will ensure three key principles:

- (1) The SEA must be ‘salient’ and cover all the important issues and concerns around shale gas.
- (2) The SEA must include groups of leading experts to ensure ‘credibility’
- (3) The SEA must be grounded in transparent and participatory processes to ensure ‘legitimacy’.

4.11.4 Publication of petroleum exploration and production regulations

In June 2015 the final regulations on petroleum exploration and production, which addresses fracking and other SGE activities, was published in the government gazette by the DMR. The publishing of the final regulations have occurred prematurely due to its release prior to the finalisation of the SEA that was launched a few weeks earlier in May 2015. The TKAG states that although there have been improvements in the second version of the 2015 regulations it still contains some flaws. Moreover, the TKAG states that the release of the petroleum exploration and production regulations undermines the purpose of undertaking the SEA, and also undermines the reliability of the regulations.

4.12 France & Bulgaria ban fracking

4.12.1 France bans fracking

Although France has the second largest shale gas reserves in Europe, France became the first country in the world to officially ban fracking (Kádár, 2014; Weile, 2014). In early 2010 the government of France issued sixty-four research and exploration permits (Weile, 2014). In France a strong anti-fracking movement demonstrated major activism and protests, which forced the French government to cancel explorations (Kádár, 2014). Under the pressure from activists, the French government revoked three permits while limiting the remaining sixty-one (Weile, 2014). In 2013, France upheld their law banning fracking (AFP news Agency, 2013). The ban

includes a ban on the research and exploitation of conventional and unconventional hydrocarbons in France (AFP news Agency). Findings reveal that the anti-fracking movement was the most important motivation behind the French ban on fracking (Kádár, 2014). Three Bills were introduced into the national assembly, while two other Bills were introduced in the Senate. These Bills would have effectively ban fracking and oil and gas explorations while cancelling the licences of the companies that had already obtained licences to conduct research, and explorations in the Paris Basin (2013).

4.12.2 Bulgaria bans fracking

The US EIA (2013) report that evaluates the oil and gas reserves of one hundred and thirty seven shale gas fields in forty-one countries reveals that Bulgaria has seventeen trillion cubic feet of shale gas reserves, and two hundred million barrels of shale oil. These reserves have the potential to satisfy the needs of Bulgaria for a century (EIA, 2013). The document shows detailed geological information about the Moesian platform located in South Romania and Central North Bulgaria. Rich in shale formations, the Moesian platform offers favourable conditions for shale gas extraction. The Etropol argillite formation is considered as the main source of hydrocarbons in Northwest Bulgaria, and the most perspective area for SGE. Within this same area is located the biggest aquifer in Bulgaria, which in case of exploitation of the gas fields stands to be affected by the technical activities of the shale gas extraction process.

A number of companies expressed interest in SGE in Bulgaria. The leading IOC that expressed most interest was Chevron USA. In June 2011 the Council of Ministers approved a contract with the American company “Chevron” thus giving them a five year permit which allowed for exploration of shale gas in Novi Pazar” (Drinov, 2011). The area is located on the territory of Razgrad, Silistra, Dobrich, Shumen and Varna. This area is also called the “Breadbasket of Bulgaria” because of the most fertile acres of land, providing the greatest amount of cereals for the country.

4.12.3 Citizen Mobilization

The response of the citizenship resulted in a great number of protests for a period of five months, thus putting pressure on the Bulgarian government to disallow fracking. In January 2012 the National Assembly imposed moratorium on all kinds of shale gas explorations (Shalegas-bg.eu, 2015). James Warlick, the American ambassador in Bulgaria criticized the Bulgarian governments decision to place a moratorium on fracking (Shalegas-bg.eu, 2015). By the end of February a revoke on the moratorium was considered. The moratorium that was placed on fracking in Bulgaria also prohibited traditional drillings for oil and gas extraction, which proved highly profitable for the Russian company “Gasprom” (Shalegas-bg.eu, 2015). These parties stressed that the moratorium on fracking in Bulgaria affects international interests. However the apt response of Bulgarian citizens, which resulted in extensive protests, caused the cancellation of the decision to lift the moratorium (Shalegas-bg.eu, 2015).

The Bulgarian Academy of Science (BAS) evaluated environmental risks caused by fracking. They concluded that exploration and exploitation of shale gas fields could not be evaluated as minimal or acceptable in all possible cases (Drinov, 2011). The BAS also stated that negative impacts could occur decades after the shale gas fields would have been exhausting (Drinov, 2011). The Academy of science also made reference to the ban of fracking in France (Drinov, 2011). The Academy of Science also found that taking action against possibilities of pollution of deep soil layers was highly limited and inefficient, and that due to the stability of the geology of the area, seismic activity would be minimal (Drinov, 2011). Furthermore, according to the BAS, the insufficient scientific information regarding Bulgarian conditions made it impossible for exact risk evaluation to be made. The BAS advised that the principle of caution is to be ensured when issuing permit for SGE on Bulgarian soil (Drinov, 2011).

4.13 Conclusion

Past explorations conducted in the Karoo are confirmed by the USA's claim of the presence of shale gas in the Karoo. The quantity of shale gas in the Karoo however remains uncertain. The ANC and the three IOCs, Shell, Falcon, and Bundu have made preparations to undertake SGM in the Karoo. The ANC government wants to pursue fracking because of the need for stable energy security in South Africa due to the load shedding in South Africa caused by Eskom's lack of generational capacity to meet the energy demands. Moreover the need for creation of employment in South Africa according to government and IOCs calls for fracking for shale gas. Representative of the ruling government are willing to pursue fracking in the face of public opposition and litigation. Anti-fracking NGO's such as the TKAG, AfriForum, CER and WESSA and WWF and the Legal practice of Derek Light are some of the key voices that have opposed the implementation of fracking in the Karoo. Members of the Karoo community at large, including farmers, have also come together to oppose fracking in the Karoo. From the findings of this case study it has been deduced that there was no proper form of public participation conducted by the government of South Africa from 2011 till June 2015. The DMR has failed to fulfil promises made to conduct effective public participation before any form of fracking takes place in the Karoo. It is evident that civil opposition has played an instrumental role in delaying the issuing of exploration licenses to Shell, Falcon & Bundu, similar to the case of France and Bulgaria. However, due to a resilient government that lacks transparency, accountability and good governance, civil opposition in South Africa has not enjoyed the same level of success as in France, and Bulgaria. Although there has been some form of public participation conducted by the three IOCs, the government have failed to effectively consult the public and conduct public participation meetings regarding fracking in the Karoo.

CHAPTER 5: RESEARCH FINDINGS AND ANALYSIS

5.0 Introduction

The study of political science involves a study of the nature of the behaviours of governments, political processes and political institutions and their relationship with citizens and vice versa. Fracking and SGM have been controversial issues at the forefront of both global politics and South African politics. With the ANC making preparations to legalise petroleum and gas exploration ventures in South Africa. IOCs such as Shell Falcon oil & gas, and Bundu oil & gas proposed to undertake fracking and SGM in the Karoo basin. Commercial SGM ventures have saved USA economy from recession by setting the USA on a path toward achieving energy independence and energy security. The USA also managed to reduce their reliance on Middle Eastern oil imports.

The ANC are looking to duplicate the same attractive benefits of energy security, energy independence, and economic growth by legalising fracking in South Africa. The proposed implementation of fracking for shale gas has faced immense opposition. The negative impacts of air pollution, water pollution, water contamination, ill human health risks, animal health risks and induced earthquakes have caused great unrest amongst NGOs, South African citizens and Karoo community members. In the process of implementation of a project, the South African government is mandated by the constitution to conduct effective public participation before any decisions are finalised. The literature review chapter discussed the possibilities that fracking may promote economic prosperity. However, its long-term economic, social and environmental sustainability are called to question.

Findings of the case study reveal that the government has intentions to promote development, economic growth job employment and energy security, whilst minimising carbon emissions in compliance with the Kyoto protocol and other LTMS. Findings from the case study chapter reveal that in the decision to implement SGM in the Karoo, the nature of public participation was unconstitutional because of the absence of public consultations, and the absence of inclusion of IAPs on the part of the national government. The lack of public participation is evident in instances of

litigation against government; mass protests and demonstrations that have occurred in opposition to the proposed fracking and SGM projects in the Karoo. The only public consultations were the public meetings held by Shell, Falcon and Bundu, which is required by NEMA. This chapter discusses the overall findings of this study regarding the nature of public participation from a political perspective.

5.1 Why the government of South Africa is pursuing fracking?

5.1.1 Energy security

There are various reasons that the ANC want to legalise the implementation of fracking and SGM in the Karoo basin. The first reason is that IOCs and promoters of shale gas have presented shale gas as a solution for South Africa to diversify their energy sources amidst the national energy crisis. The increase in energy demands in South Africa are the reason for the load shedding that have been resulting in sporadic nationwide power cuts. The ANC are aware of the fact that energy plays a crucial role as a poverty alleviating mechanism that maintains employment, and causes its increase. Poverty alleviation cannot occur in the absence of a stable and secure supply of electricity. The ANC are also aware of the benefits that the USA has accrued from their extensive implementation of fracking and SGM at the commercial level. Since South Africa's economy is heavily reliant on electricity that runs mainly on coal, it is perceived that shale gas resources if tapped, will contribute to meeting that is needed for the unhindered operation of domestic and industrial activities. In ensuring energy security the NDP aim to increase the number of those that have access to the national grid to ninety percent by the year 2030. Fracking for shale gas could also help to create markets that would generate revenue from exporting natural gas to other countries. Fracking could also make vast reserves of oil and gas available for South Africa to expand its capacity to produce electricity.

5.1.2 Job creation & poverty alleviation

Levels of poverty and unemployment in South Africa are disheartening from a social welfare perspective. Since the end of the apartheid regime South Africa's democratic government has been presented with the task of ensuring national economic growth, and poverty alleviation. This has been defined as the first priority of the ANC because

according to the RDP (1994) no democratic state can develop if the majority of its people live in abject poverty. Poverty in South Africa is also shared by the majority of the Karoo population who may benefit from development ventures that bring employment to their area. Poverty alleviation is discussed in the RDP (1994), and in the NDP by the NPC (2012). Those living in abject poverty look to the national government and private sector to help improve their living conditions. Since fracking could bring about new jobs government believe that it is worth pursuing.

5.1.3 Reduction on intensive reliance on coal

Shale gas has been presented as a cleaner energy source than coal and oil. This is because of the fact that it is methane from shale that is used to generate electricity. The use of shale gas is perceived as a climate change mitigation strategy. This argument makes shale gas attractive to the South African government. Findings of this study indicate that the ANC is pro-fracking. South Africa is the fifteenth largest emitter of CO₂ in the world, and the leading emitter of CO₂ on the African continent. In compliance with the UNFCC Kyoto Protocol and the Copenhagen accord South Africa is obligated to find ways to reduce their GHG emissions. The national government are very steadfast about their pursuit of fracking for shale gas in the Karoo to the point that they have ignored sound scientific reasoning from studies around the world, that advise their governments to proceed with caution or implement precautionary principle - that is, to forgo developments in the face of uncertainty of the benefits and risks that may arise from them. From an environmental perspective shale gas may prove beneficial for carbon mitigation. It is also believed that the environment could profit from the decreased carbon emission by using shale gas rather than coal.

5.2 What are the positive and negative socio-economic and environmental impacts of Fracking?

5.2.1 Positive Socio-economic and environmental impacts

The positive socio-economic impacts of shale gas are evident in the discussion of the reasons why the government of South Africa wants to pursue fracking for shale gas in the Karoo. Shale gas could act as a bridge fuel till a significant transition to renewable

energy is made. As already mentioned, economic growth is also perceived to accompany the use of shale gas as a bridge fuel. From an environmental stance shale gas has been promoted as a cleaner burning fuel than coal and oil, and is presented as a carbon mitigation strategy that wean carbon-intensive states off their dependence on coal resources.

5.2.2 Negative socio-economic and environmental impacts

The negative aspect of job creation regarding fracking is that fracking may not create long-term or sustainable jobs. Fracking jobs are not a source of sustainable employment because once the gas from a fracking well have been exhausted, the well is plugged and decommissioned and as a result, locals that initially had jobs are once again left without jobs. Another reason that fracking jobs may not be sustainable is that it creates a few jobs for locals, a few jobs that do not require any form of expertise. Fracking and SGM may also not be sustainable because the quantities of shale gas reserves that have been estimated around the world are not proven. Rather, estimates are generated from a desktop study rather than actual feasibility studies. The disclosure of actual quantities of shale gas in the Karoo for example, would require undertaking exploration. Fracking has generated a great amount of controversy, which has given rise to the nature of contentions in the fracking debate.

Fracking has been described as a violent method that has hazardous health implications for people and the natural environment. Documented cases and experiential knowledge of people that have lived near fracking activities have confirmed the reality of these health implications. Symptoms that result when one comes into contact with frac-fluids include projectile vomiting, skin irritations, and respiratory problems. The literature review discussed a documented case of a nurse having experienced serious stomach, liver and lung problems after treating a patient that had been involved in a frac-fluid spill. Fracking and other SGM activities may also generate a lot of noise pollution. Other health impacts of fracking include skin and eye irritations, congenital heart disease and neural tube defects. Other organs in the body may be affected from fracking such as the brain, the kidneys, and gastro intestinal systems. There have been documented cases where farmers have reported miscarriages and other death related cases amongst their livestock. The deaths resulted from the livestock having drunk or eaten grass contaminated by frac-fluids.

Noise pollution is also another source of aesthetic concern when it comes to fracking. Horizontal shale gas drilling is a very loud operation in combination with other activities such as truck movements, gas flaring and wastewater treatment. Another negative impact regarding fracking is that it is a water intense activity. Findings reveal that it requires about twenty million litres of water to frac one well. Apart from water consumption rates, water pollution is also an area of concern. Water pollution may occur underground, with fracking chemicals or methane directly contaminating aquifers and drinking wells, or above ground water sources such as streams or tributaries. Furthermore, the possibilities of fracking as a potential land grab have not been ruled out. In the case of South Africa, fracking has left land in the Karoo vulnerable for the acquisition of IOCs Shell Falcon & Bundu. Another negative impact regarding fracking is that it has been said to induce earthquake activity.

Worldwide, fracking and SGM ventures have also been opposed by citizens due to the lack of accountability from their governments. This has resulted in the political struggle for accountability through mass protests, and demonstrations. Governments in most countries have failed to represent the interest of their citizens regarding fracking. There was no platform given for citizens to engage with their governments regarding fracking initiatives- whether they were in favour of it, or not. This is a big social issue that has political, cultural, social, economic and environmental implications. It is the lack of accountability from governments that led to the formation of the global frackdown movement. Around the world civil resistance has led to bans and moratoria on fracking. Countries such as France, Bulgaria, Germany, Wales and Scotland are examples of this. Governments in Britain, Poland and South Africa continue to disregard civil opposition to fracking.

5.3 What are the arguments of both opponents and proponents of fracking and SGM?

Findings of this study reveal that proponents, or those in favour of fracking promote fracking and SGM on the basis that it provides energy security and independence in the midst of a global energy crisis, and in the midst of global warming. Proponents assert that unconventional shale gas and oil is the solution to the energy crisis. Proponents of fracking and SGM see natural gas as a resource that could help mitigate

the carbon emissions that are a result of the intensive use of coal. Economic prosperity, industrial growth, employment and job creation are cited by proponents as the resultant benefits that accrue from the use of unconventional shale gas. Thus unconventional shale gas is presented by proponents as a bridging fuel that could aid in meeting national energy demands till a significant transition to renewable energy technologies (RETs) such as wind, solar energy and biomass is attained. Opponents of fracking for unconventional shale gas argue that fracking and SGM are accompanied by negative socio-economic and environmental impacts such as air pollution, water contamination, water consumption, land grabbing, environmental degradation, induced earthquakes, loss of jobs, death of animals and ill health in both animals and human beings. Proponents have often stated that these impacts of fracking have not been scientifically proven. Opponents respond saying that the disproval of such negative impacts posed by fracking have not been disproved either.

Regarding the Karoo fracking debate, scholars such as Cramer argue that the same benefits that the USA's shale gas industry has enjoyed from fracking cannot be duplicated in South Africa. Crammers' reason for this is that the political and environmental climate of South Africa differs greatly to that of the USA. Scholars such as Franco, and Fig, see fracking as a water grab and a land grab that may leave twenty percent of the Karoo and its resources vulnerable to the acquisition of foreign Multi-nationals. Furthermore, the lack of public participation in the decision to implement SGM in the Karoo has also strengthened the voices against fracking in the Karoo. Scholars such as de Wit maintain that fracking in the Karoo should involve collaboration between IAPs who should collaborate to devise solutions that mitigate the negative effects of fracking and other SGM related activities.

5.4 To what extent is public participation evident in the decision-making process relating to SGM in the Karoo?

Findings indicate that at a national level there has been a decreased level of trust of citizens in the leaders and executive institutions of South Africa. This lack of trust has been mirrored in the Karoo. When the ANC initially wanted to allow for the implementation of SGM in the Karoo, they did not do well to consult the public. What the government did was to announce their decision to proceed with its implement

through the media, without any form of creating public awareness, public education and public consultation on their decision. Arnstein (1969) labels this type of behaviour from decision-makers as non-participatory.

The reason that the government of South Africa placed a moratorium on fracking was because of the fierce opposition that they encountered from local communities, and other IAPs within South Africa. The moratorium was not placed because of concern of the government for the people. It was only when public opposition arose that the government undertook to gather information on the benefits and demerits of fracking through the ministerial task team. The ministerial task team however, did not conduct thorough investigations regarding the benefits and potential of fracking. Rather, the report that they compiled was largely based on studies that had already been conducted in the USA. Contrary to Arnstein's (1969)'s definition of public participation, in the Karoo case, power was not redistributed to allow the have-not citizens to be included in the political process of participation. Contrary to Samuels's definition of public participation, there was an absence of equitable sharing of decision-making power between the elite government, and the disadvantaged. Although some of the populations of the Karoo are not educated enough to understand fracking, it is the responsibility of the government to educate the Karoo community through transparent and accountable forms of public consultation. This type of participation occurs when decisions are made behind closed doors without public involvement, is referred to by Arnstein (1969) as a manipulative, and therapeutic type of public participation. These are the two lowest levels of public participation according to Arnstein (1969) Moreover, according to Choguill this lack of participation sparks controversy for two reasons; it lacks public involvement, and also the fact that the consequences that a development might encounter due to the absence or lack of public participation may be inevitable.

The South African public were not able to comment on such as the MPRDA, and the final regulations on petroleum exploration and production, which recently published in the government gazette, was done prematurely. One positive outcome regarding participation was the rejection of the MPRDA due to the fact that it lacked constitutional muster because of the lack of public participation. The findings of this

study reveal that there was no transparency and accountability regarding shale gas initiatives in the Karoo between the public and their government. As a result the public were not empowered by the national government, and were not given sufficient opportunity by the national government to influence the decisions pertaining to issues relating to fracking and SGM. The decision to implement SGM in the Karoo was based largely on technocratic and bureaucratic decision-making. Some of the meetings that were held regarding decisions to undertake SGM were conducted behind close doors. The proceedings and minutes of these meetings were also not readily available for public screening. The proposed implementation of SGM in the Karoo is unconstitutional, undemocratic, lacks transparency, accountability and good governance. The actions of the national government have not been in-line with the public participatory principles of NEMA. This has rendered their actions to proceed with fracking as invalid, as stipulated by the South African Constitution. An offence also against the local communities of the Karoo, the people of South Africa, and also against the principles of institutions such as the SAHRC, the Public Protector and the PSC, which exist to ensure that constitutional principles are adhered to.

5.5 Conclusion

There is a greater call for public involvement in the establishment of science and technology policy all around the world. Regarding SGM in south Africa, the involvement of the Karoo communities has to be in line with democratic values and methods of public participation that are mentioned in the constitution, NEMA, and in the ASAGLP handbook on public participation. No matter how technical a development project may seem, IAPs are to have their government inform them, educate them and engage with them about the development. The lawful requirement of public consultation has been overlooked. There has been a lack of holistic government consultation with IAPs in South Africa. As it stands many of the communities living in the Karoo remain uninformed about fracking, and the impacts that the activity can have on them socially, economically and environmentally. The national government should have been the first to engage with the public before any decision to implement fracking was taken. The lack of public involvement is evident in the inability of the DMR to disclose the full members of the technical task team upon request. Moreover, promises made by Minister Susan Shabangu, Minister of the DMR, to consult the Karoo community were not kept. The members of the public were not given the opportunity to submit their comments regarding the MPRDA. The processing of the MPRDA was rushed and lacked constitutional muster and was rejected as a result. The transparency stipulated in the Constitution, of the Republic of South Africa, was not adhered to from the time fracking was proposed in 2008, till October 2014. The fight against fracking has however caught the attention of the government to take the people into consideration before implementing fracking. If the decision to implement SGM in the Karoo included public consent then the actions of the national government would be in line with democratic principles and the Constitution of the Republic. However, since the opposite is true, public participation from the part of the national government remains invalid.

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

6.0 Introduction

According to the US EIA (2013) forty-eight shale gas basins have more than five thousand seven hundred and six trillion cubic feet of recoverable shale gas deposits. Some of these countries that have shale gas resources, are located in Europe, Asia, North America, South America and Africa. The USA, Canada, Argentina and China are the only four countries in the world that are fracking for unconventional shale gas and oil commercially. States such as France and Bulgaria have banned fracking. On the African continent Algeria have the largest shale gas reserves, with South Africa following behind. Initial shale gas estimates put South Africa at four hundred and eighty five trillion cubic feet, as having the fifth largest gas reserves in the world. A change in estimated figures reveal that there is much uncertainty regarding the amount of shale gas that is present in the Karoo. The only way to determine the presence of shale gas in the Karoo is to conduct SGE activities, which would require fracking. Since 2008 the ANC has been making preparations to legalise fracking and SGM in South Africa. This has sparked local, national and international opposition. The ANC wants to proceed with fracking in the Karoo as an attempt to ensure energy security in the midst of an energy crisis. This chapter thus concludes the study on the nature of public participation in the decisions to implement SGM in the Karoo. The final part of this conclusion will give recommendations on what can be done to ensure a more effective public participation in South Africa as to proceed from levels of non participatory participation to levels of participation.

6.1 The fracking debate

Fracking process involves drilling into the earth at depths of four to five kilometres to reach formations where unconventional oil or natural gas reserves exist. The main need for the promotion of fracking is due to the global energy crisis. The global energy crisis has plagued many states, and has left national government unsure about the future of their electrical supplies. A secure energy supply is important in ensuring sound business operations, and the development of a stable socio-economic society.

South Africa is a prime example where an energy crisis has crippled the economy, hindered industrial activities, disrupted institutional functions and domestic lives. The World Bank emphasises the fundamental role that energy security plays in sustaining activities that aid in creating jobs and poverty alleviation. Apart from South Africa, other African countries do not have a steady supply of electricity and thus are limited in further expanding the growth of their economies, and the development of their adverse social conditions. Often time's energy is taken for granted and even misused at industrial and domestic levels. However, when it is not readily available, one can realised just how crucial a secure supply of energy can be for a nation. This has been a hard lived experience for South Africans over the years as the sole national energy supplier Eskom has been unable to meet the electrical demands of the national energy grid. Fracking and SGM have been known to enhance geo-political bargaining power in the international political arena. In the same light fracking and SGM may serve as the ideal mechanism for diversifying nations energy mix. Fracking and SGM are also promoted as the mechanism that can help to achieve national security and energy independence for any nation that may harnesses shale gas reserves. Fracking is now being popularised around the world like a trend set by Americanisation and spread by globalisation. Fracking for unconventional shale and oil resources is being promoted both in underdeveloped and developed countries as a win-win, game changing bridge fuel that can be exploit and use until a significant transition to RETs has been completed. Currently, renewable energies in South Africa are not sufficient enough to meet the entire nations energy demands.

In South Africa the implementation of fracking has stirred great controversy and has given rise to a controversial debate on fracking in the South African context. On the opposite sides of the heated debates are two main camps of the opponents and proponents. Opponents are against fracking and SGM, and proponents are in favour of its development. Proponents of fracking and SGM argue that shale gas is a cleaner burning fossil fuel than coal and oil resources. Some scholars argue that fracking could help to curb greenhouse gases emitted by coal and oil reserves. It is believed that natural gas could in theory release less fugitive emissions than coal. Other scholars however contend that shale gas should not be used as a bridge fuel because its use would come at a great cost to the natural environment. This camp of scholars

argue that over a long period of time, the potency of methane from shale gas would propagate climate change at worse levels than CO₂

It has also been argued that the USA has had huge success with fracking and SGM. It is accepted that SGM is what lifted the USA out of its economic recession, and set it on the path of achieving near-energy independence. Estimates that have been made concerning the viability of shale gas in the USA are very promising. Estimates reveal that forty five percent growth annual growth that the USA shale gas industry that occurred between 2005 and 2010. Moreover it is believed that the current rate of shale gas production could be sustained for over a century. In the USA, reliance on imports from Middle Eastern countries for oil has been curbed as a result of extensive fracking and SGM ventures

Regarding socio-economic health impacts the implementation of SGM has been known to cause job losses in the agricultural and tourism sector. On the contrary oil and gas industries always elaborate on the potential that fracking has to create employment opportunities. Some environmentalists, economists and geologists argue that the high estimates of employment levels that are to result from fracking are too optimistic. The SGM industry and promoters of fracking in most cases, fail to discuss the jobs that have been lost as a result of SGM ventures. One such document that fails in this regard is the Econometrix report that was commissioned by Shell South Africa. In the USA many of the new jobs that are created by fracking and SGM venture in PA are given to skilled non-local workers who return home after they complete their duties. Jobs that are perceived as being created by fracking are offset by the amount of jobs that are lost in other sectors as a result of fracking.

In the Karoo fracking/SGM debate it is evident that shale gas could play a significant role in contributing to the diversification of South Africa's electrical power industry whilst creating jobs in other industries outside of the fracking operations. These industries according to Botha & Yelland (2011) include CCGT power stations, steel works and a variety of other plants, factories and secondary commercial, business, transport and hospitality industries.

Environmentalists and fracking activists in South Africa and around the world oppose fracking in its current form. This is because fracking in its current form is unsustainable and requires further developments, and innovations that could help to minimize its associated negative socio-economic and environmental impacts. Environmental impacts that accompany fracking include ground water, sub-surface water pollution, water consumption, air pollution and soil contamination. Other environmental concerns that have made fracking and SGM a controversial topic is the fact that it causes earthquakes. Documented cases of these associated impacts have strengthened the arguments of fracking opponents. The impact on fracking on air quality is that it decreases it as revealed by a study conducted by Colborn et al (2011), Howarth, Ingraffea & Engelder (2011) and Shafer, Williams & Mook, (2012). Fracking chemicals have been known to cause respiratory problems such as asthma, lung dysfunction and heart problems. Moreover studies confirm the grievances that residents in Colorado's Garfield County have voiced as a result of experiencing ill health effects such as tumours, headaches, nausea, joint pains, and breathing problems. It has also been reported that frac-fluids are cancerous.

Regarding fracking in the Karoo, opponents hold that IOCs such as Shell are not to be trusted due to their poor track record of environmental pollution in places such as the Niger delta, and the massive oil spills that they caused in the arctic. Scholars and Karoo community members do not trust the IOCs to undertake safe fracking due to the fact that 'safe fracking' cannot be ensured due to the discussed impacts of fracking. Regarding the Karoo fracking debate, the governments must proceed with caution in its implementation. This is because documented cases reveal that fracking has caused water pollution, mass water consumption, air pollution, earthquakes and sicknesses in both humans and animals. Moreover it has been stated that fracking in its current form is unsustainable because of the potential it has to offset jobs in the agricultural and tourism sector, which may pose a threat to food security, and repel tourists from tourist destinations in the Karoo. It has also been recommended that RETs be developed to meet energy security needs. The negative impacts that result from fracking are a hindrance to the promotion of sustainable development and as a result. The precautionary principle should therefore be applied in the face of uncertainty of the risks of fracking and SGM.

6.2 Public Participation globally & Locally

Apart from the controversies regarding the environmental consequences of fracking, there is also a significant amount of controversy regarding the lack of transparency on the part of representative national governments worldwide. The trends regarding trust of citizens for their governments regarding the implementation of SGM and fracking in democratic states are shocking. This lack of transparency and accountability in the implementation of fracking and SGM draws attention to a crisis in democracy worldwide. This lack of public participation has been evident across the USA, South Africa, Britain, Poland, China and Algeria. According to Choguill protests or demonstrations are a result of a lack of public participation. It is civil resistance in the form of mass protests and demonstrations that have led to banning of fracking in countries such as France and Bulgaria. South Africa and Algeria have also experienced mass protests against fracking national level.

6.3 Fracking bans in four European countries

Fracking bans across the world have been characterized by heavy civil opposition and mass protests due to the nature of fracking impacts on the environment and also the lack of public consultations by representative government. There are four countries in the world that have ban fracking. France, Bulgaria, Germany and Scotland. France became the first European state to officially ban fracking in 2011. Bulgaria became the second European state to ban fracking and as a result, revoked a shale gas permit that it had initially granted to Chevron. Germany became the Third country to ban fracking whilst Scotland became the fourth in January 2015. A single common feature evident in these countries is the effective civil opposition that arose which contributed to the banning of fracking. What is evident across these four nations is that they refuse to implement fracking within their borders until it can be scientifically proven that fracking will not cause harm to their natural environments.

6.4 Theoretical Aspects of Public participation vs. Practical participation in South Africa

The model of decision-making by means of public participation dates back to the time of Greek city-states, where participation by all citizens were mandated to participate in political affairs. Athenian democracy afforded all citizens power to participate regardless of their socio-economic status. It is where the model of neo-liberal democracy derives a significant part of its characteristics. In neo-liberal democracies it is evident that a lack of accountability exists on the part of governments. This lack of transparency and accountability is most present in developing countries in the form of corruption, mired conspiracy and secrecy. Citizens are to be given equal opportunity collaborate and deliberate as part of the decision-making processes. Public participation requires that power that may be held by the government, be shared equally amongst the people so that those that are presently excluded from the political and economic process are deliberately included as is stated by Arnstein. In Current levels of public participation are almost non-existent when it comes to the uptake of new development initiatives, and science-based technologies.

South Africa having had a rich history of public participation in the drafting of its constitution is currently lacking in public transparency, accountability and good governance. The turning point of this part of South Africa's historical disadvantages was the rise of the freedom charter, which demanded that all people of the Republic of South Africa should govern. The nature of South Africa under the Apartheid regime was characterized by the suppression of public participation amongst certain racial groups. Since the abolishing of the apartheid regime public participation became all-inclusive regardless of race. Although the three oil and gas companies Falcon, Shell and Bundu, have conducted public participation meetings as a mandatory requirement of NEMA and their EMP, it suffices to say that these public participation meetings have not been adequate and all inclusive enough to represent the majority population of Karoo communities and local residents. The national government should have rather engage with its citizens before any IOCs did so.

The reason public participation exists, is to address any concerns, grievances and opinions that IAP's may have with regard to any development project no matter how technical. Sections 59, 72 and 118 of the Constitution of the Republic of South Africa make it a requirement for both the national, and provincial levels of government to facilitate public participation. Furthermore, section 195 of the Constitution maintains that the public are to be encouraged to participate in policy-making.

Non-profit organisations such as the TKAG, AfriForum, CER, WWF, WESSA amongst others, and the Karoo based law firm, Derek Light Attorneys have fought to hold the national government accountable for its lack of public participation, and the unconstitutional way in which they have proceeded to make preparations for the implementation of fracking in the Karoo. TKAG successfully sued the DMR for failing to disclose information about their task team to the public of South Africa upon request. Moreover promises to conduct public meetings and public consultations in the Karoo, by the DMR had kept for close to four years. The national government has also failed to take practical initiatives toward educating the public, especially those that live in the Karoo that have no access to media resources such as television, newspapers, and internet access.

The survey that was conducted over a period of ten years (2003 to 2013) reveals that there has been an undeniable decreased level of public trust in leaders and the executive institutions in the republic of South Africa. The confidence of the people in the ruling government has also experienced further decline because of other instances of corruption. The nature of public participation in South Africa regarding fracking in the Karoo has therefore been unconstitutional and farcical. Arnstein would describe the nature of such participation as tokenistic: a shallow level of public participation.

Moreover, regarding environmental justice, the constitution of the Republic of South Africa affords all South Africans a right to an environment that is not harmful to their health or well being, it is right that ensure that fracking does not transform the Karoo into such an environment. The documented cases of the lack of Shells expertise in containing oil spills in the Niger delta, and polluting ground water resources in the USA as a result of fracking, indicate that they are incompetent in keeping their promises to safeguard the Karoo from fracking operations. Fracking operations should

not be harmful to the health or well being of Karoo communities. Moreover the decision to perform fracking in the Karoo should take into account the ability of future generations to meet their personal needs. This can only be ensured if resources are left intact and untouched by fracking and other SGM related activities, if they are to take place. It is logical that fracking should not be implemented till there is concrete scientific evidence that the practice is safe to undertake in the South African context.

One possible reason that government do not take the time and effort to consult and inform their citizens regarding a development project is that the process is too time consuming. Another reason is that they may perceive citizens as ignorant and lacking in the area of expertise. They may see the views of the public as a threat or hindrance to the intended development project because of other factors such as attitudes, beliefs, which may affect the potential of the public to make significant contribution to complicated policy decision-making (Rowe & Frewer 2000; McCallum & Santos 1997). This is a possible reason that most of the meetings the government had regarding fracking in the Karoo have been technocratic –centred decision-making. Technocratic decision-making holds that experts are crucial partakers of decision-making structures in the public and private sectors because of their technical skill. It is for this reason that Shell Falcon and Bundu have collaborated with the government of South Africa to push the fracking agenda in the face of public opposition.

From Arnstein (1969) ladder of participation for and Choguill's (1996) ladder of participation for underdeveloped countries, it is clear that the nature of public participation before the public initially voiced their opposition to fracking is characteristic of manipulation. This is because the citizens of South Africa, especially the Karoo community were not properly empowered to effectively partake in the decision to proceed with fracking. Citizens were told the intended course of action that the government is to pursue. The lack of public involvement in the decision to implement SGM in the Karoo was evident from the behind-closed-doors discussions that were held regarding fracking. There were no mutual discussions that were held between the Karoo community and the South African public with their representative government. There was no allowance of feedback or negotiation, and the decision to forge ahead with SGE and SGM ventures had already been taken.

The nature of public participation in the decision to implement shale gas mining in the Karoo was also characterised by the level of the rung of the ladder, which is called the rung of “conspiracy”. This type of lack of public participation causes conflict between governments and their citizens. Protests against fracking and the local governments accompany the consequences of these levels of non-participation. Consequences include the example of litigation against the government as was evident between the TKAG and the minister of the DMR, Susan Shabangu. In this level of participation the government and IOCs do not take caution in possibilities of disenfranchising local communities, disrupting their cultural heritage, their livelihood and way of life. The Karoo community may have been disenfranchised by now if organisations such as the TKAG, AfriForum, CER and WESSA and other environmental non-governmental organisations had not intervened to hold national government accountable for their plans to proceed with fracking.

Regarding public comments on the various EMP's, and the MPRDA it is required by the National Environmental Management Act that a period of thirty days be given for the public to raise their views, and voice their concerns and opinions regarding any aspect of the documents. In some instances, less than thirty days was given for the public to submit their comments, which was not sufficient enough. This was characteristic of Arnstein's rungs three and four, namely “informing and consultation which proceed to a level of tokenism because efforts that were made to include the views of the public regarding the EMP of Shell, and the MPRDA, were carelessly rushed. This showed that the efforts were made to adhere by the public participation requirements of NEMA, creating an impression that public participation was conducted.

Another reason for the opposition of fracking is due to a possible land grab that it could cause. In the case of fracking in the Karoo shale gas makes twenty percent of South Africa's land area vulnerable to land grabbing by the Shell, Falcon and Bundu and their respective oil and gas partners.

Most complaints and activism against fracking is due to the large water resources that it is required to perform one fracking operation. Water is a scarce resource in the semi arid Karoo and a most valuable resource that is vital for the sustenance of Karoo communities who are reliant on underground water reserves.

In the State of the Nation Address (SONA) 2015 the members of parliament (MPs) who were faced with a water crisis for only a few hours realised the importance of having ready access to drinking water. MPs became agitated and began chanting bring back the water. The unbearable nature of During the state of the nation Address (SONA) 2015 MP's had the opportunity to experience of being in an environment that had a lack of signal, a lack of water services in a humid enclosure proved more than unbearable. This experience was symbolic of what people in the Karoo have to deal with over periods of water shortages. It is recommended that government take into consideration of Karoo communities' lives and respect their cultural heritage, their environment, which includes their air, water and soil resources. Although the government have the mineral rights of the shale gas that lies beneath the Karoo, it is important that the government respects the land rights of the people that own the surface of the land.

From an economic and environmental perspective, SGM may prove to be a long-term burden on a long term basis because of the negative impacts it has been revealed to have on wildlife, farming livestock, air quality, water quality, water quantity and human health. The government should therefore acquaint themselves with the facts that hard scientific evidence and documented cases have to reveal about fracking and proceed to make an informed decision. It is also good that government have a good foundational knowledge of the socio-economic and environmental conditions of the Karoo basin and the resources such as water, and the activities such as agriculture and tourism, on which the people there are dependent on for the sustenance of their daily needs and livelihoods. The SEA initiated by the DEA may aid to ensure that this is achieved.

Upon considering the implementation of fracking and SGM, democratic countries need to include the members of the public in the decision-making process since fracking is likely to affect them directly. It is therefore recommended that South

Africa, follow the example of France, Bulgaria, Germany and Scotland in banning fracking in the face of opposition till it can be one hundred percent scientifically proven that fracking, and other SGM activities do not pose any threat to the natural environment and human health. Such a decision would safe guard the Constitutional rights of the Karoo community from an environment that is harmful to their environment and their health as stipulated in section 24 (a) of South Africa's Bill of rights of the Constitution of South Africa (1996). Although fracking may present secure energy supply for South Africa along with benefits of economic prosperity, it is recommended that fracking as a technology must only be implemented when it can be proven that it is non hazardous to humans and animals and the environment.

Fracking if it were to be undertaken in South Africa, would require an appropriate regulation tailored to disclose and address environmental impacts. Regulations of such caliber would have to be implemented, monitored and enforced. Without enforcement regulations would fall short of their intended purpose. The CER recommended that an EIA on fracking would have to comply with existing legal frameworks such as the Constitution of South Africa, NEMA, NEMWA, and Air Quality Act. In a nutshell, the CER maintained that fracking was to uphold sustainable development, ensure open and transparent decision making, public access to information pertaining to fracking, adhere to the polluter pays principle, the public trust principle and the prevention of unfair discrimination (CER, 2013). It therefore important that the South African government deepen its relations with citizens so that they get to hear exactly what the needs of the people of the Karoo is. This I believe should compel the South African national government to act in the best interest of Karoo community members.

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