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**IMMUNISATION OF THE AFRICAN RESOURCE CURSE BY WAY OF
BENEFICIATION: A STUDY OF SOUTH AFRICA AND MOZAMBIQUE'S EMERGENT
SHALE GAS SECTORS**

by:

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ABSTRACT

The aim of this study is essentially to explore the African Resource Curse (the “ARC”), the concept of beneficiation, and whether beneficiation could address the risks associated with the ARC for purposes of South Africa and Mozambique’s emergent shale gas sectors.

In order to explore this link between beneficiation and the ARC in the aforementioned emergent sectors, this study will seek to primarily answer whether South Africa and Mozambique can “immunise” themselves from the ARC through beneficiation and more specifically bilateral beneficiation with one another.

In order to answer this primary question, the following facets will be explored, namely: the characteristics of the ARC and the socio-economic effects thereof; the characteristics and benefits of beneficiation, value addition to the emergent shale gas value chain; the African Mining Vision; the methodology of implementation of beneficiation; and lastly a contextualisation of beneficiation in South Africa and Mozambique in consideration of their respective regulatory frameworks and current mineral clusters.

The emergence of shale gas sectors in Africa presents an opportunity to exploit resources in a manner that is fruitful in not only the hands of industry stakeholders, but also in the hands of the state that possesses the resources. Bearing in mind that these sectors are emergent but imminent, South Africa and Mozambique are presently afforded time to arrange their affairs and policies in order to extract as much benefit out of their resources as possible for their state, while still allowing for an investment friendly sector. This study therefore aims to explore a solution before a problem has the opportunity to materialise.

In order to address the risks of the ARC in the emergent shale gas sectors of South Africa and Mozambique, a value chain can be created and supported that is not halted by the borders between the states. Each state has something to offer the other in respect of the linkages in the shale gas sector and midstream and downstream activities. Working together with the support of good and investment incentive governance enforced collectively and domestically, can make value added beneficiation and bilateral beneficiation a reality.

LIST OF ACRONYMS

AMV:	African Mining Vision
AU:	African Union
ARC:	African Resource Curse
BEE:	Black Economic Empowerment
DMR:	Department of Mineral Resources (South Africa)
ECA:	Economic Commission for Africa
EITI:	Extractive Industries Transparency Initiative
FDI:	Foreign Direct Investment
GDP:	Gross Domestic Product
GTL:	Gas-to-liquid
IOCs:	International Oil Companies
MCSA:	Mineral Council of South Africa
PetroSA:	Petroleum Oil and Gas Corporation of South Africa
RDC:	Resource Development Corridor
SADC:	South African Development Community
SAOGA:	South African Oil and Gas Alliance
TNOCs:	Transnational Oil Companies
UN:	United Nations
UNCTAD:	United Nations Conference on Trade and Development

KEYWORDS

BENEFICIATION, VALUE ADDITION, SHALE GAS, AFRICAN RESOURCE CURSE, SOUTH AFRICA, MOZAMBIQUE.

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CHAPTER 1:

INTRODUCTION, BACKGROUND AND RESEARCH METHODOLOGY

1.1. Introduction

The Extractive Industry, and specifically the oil and gas sectors are inherently capital-intensive projects with long lead-in times. Consequently, investment in an extractive project will be driven by investors and their investment interest. Developing states which possess resources, often rely on Foreign Direct Investment (“FDI”) in order to develop their local extractive industry when local investors, or the state itself cannot afford to develop a domestic-driven sector.

A result of having a FDI driven sector is that not all the monetary fruits of a host state’s resources will be retained domestically. As an example, state A possesses rich endowments of gold, but the project does not employ a local workforce, and does not refine the gold but rather exports the raw gold ore. It is evident that state A does not enjoy the full potential benefit of its resources. This example is extreme, but the aim of this study centres around this idea, the idea that states should address the benefits they are receiving from their resources and strive to add value to, and gain beneficiation from its resource endowments.

This study will focus on the tripartite relationship between the state (and its fiscal), the interests of that state’s citizens and foreign investors in the realm of the emergence of shale gas sectors in South Africa and Mozambique.

Shale gas is gas which is essentially trapped in low porosity and ultra-low permeability deep shale rock layers underground.¹ Because the gas is trapped, special technological solutions such as hydraulic fracturing and horizontal drilling is required to extract and capture the natural gas. The South African Oil and Gas Alliance (“SAOGA”), an organisation aimed at building partnerships between the public and private sectors of

1 SAOGA “Overview of the Onshore Shale Gas Industry and key implications for the MPRDA Amendment Bill process” *The Select Committee on Land and Mineral Resources* (2017) 6 (“SAOGA”) <https://pmg.org.za/files/170613SAOGA.pdf> (accessed on 10 October 2018).

South Africa in order to promote the upstream and midstream sectors of the oil and gas sectors of Southern Africa,² provides the following illustration of the location and means of extraction of shale gas (Figure 1).³

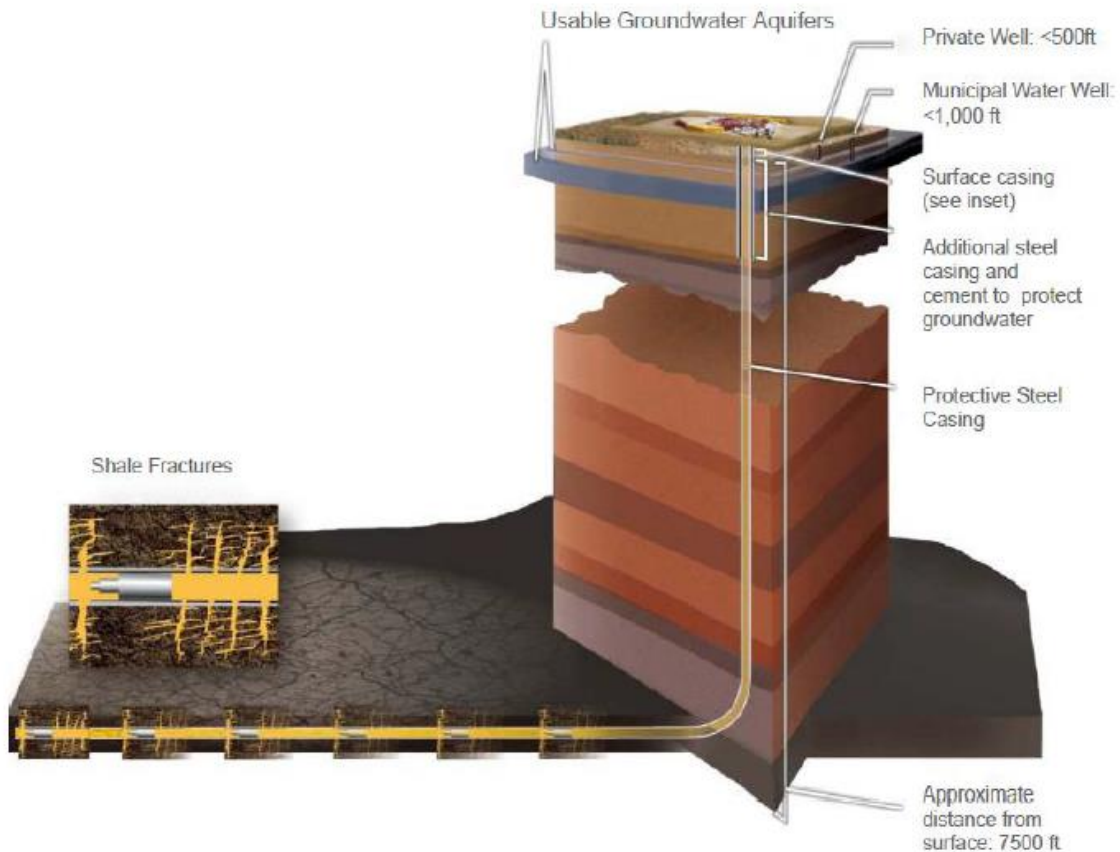


Figure 1: Shale gas location and means of extraction⁴

Significant natural gas accumulations in Mozambique were discovered in 2013, and this discovery has been estimated as having the potential of being the fourth largest source of natural gas in the world.⁵ Whilst developing a new sector, such as the gas sectors of South Africa and Mozambique, a value chain needs to be established in order to have a fruitful sector and individual project. A “value chain” is a model used to describe the process whereby a raw material is received whereafter the raw material is subject to

2 SAOGA “What we do”
<http://www.saoga.org.za/about-us/overview-saoga> (accessed 19 October 2018).

3 SAOGA (note 1 above) 6.

4 *Ibid.*

5 Clifford Chance “New Petroleum Law: The Future of Oil & Gas in Mozambique” (October 2014) 1.

processing or refining in order to create a final product of greater value which then becomes a commercial product and is sold to customers.⁶ This value chain will be created through infrastructure, regulatory frameworks and trading guidelines. This study will explore this value chain and the means by which the value chain (*i.e.* from accumulation through to the refined final product) can be most beneficial to a host state,⁷ in order to avoid the African Resource Curse (“ARC”) through the implementation of the value chain.

According to the phenomenon of the ARC, which will be further delved into in this study, it anticipates that the role players who possess capital to realise the resources will harness the majority of the monetary gains from a project, whereas the state and the people of the state who possess these resources will only harness the minority. According to the ARC, this is historically particularly true in African states where large concentrations of resources are found, but the realisations of these resources do not correlate to health of the economy of these African states.⁸

The ARC, and the solutions thereto, have been studied in detail in the past, however this study will aim to focus beneficiation as a means to address this phenomenon.

1.2. Background to the research problem

The African Resource Curse - the plague of plenty. Africa, despite being blessed with resources aplenty still consists of economically developing states. Are African states at risk of being exploited by virtue of their possession of high-volume potential resources?

With the development of the “global community”, and the consequent development of international law, which feeds into the development of local national legislation and the drive for international good practice, the question arises whether this phenomenon could possibly be eradicated. This paper will study beneficiation as a means to retain economic potential as far as possible down the value chain of an extraction project.

The emergence of shale gas globally, and more specifically in southern Africa, presents an opportunity to exploit resources in a manner that is successful in not only the

6 Investopedia “What is ‘value chain”
<https://www.investopedia.com/terms/v/valuechain.asp> (accessed 15 October 2018).

7 For the purposes of this study, the term “host state” refers to a country or internationally recognised state that possesses non-renewable resources which are subject to extraction or exploitation, whatever the case may be, and wherein the extractive industry project is located.

8 R.A. Badeep *et al* (2017) 51 *Resources Policy* 123.

hands of industry stakeholders, but also in the hands of the state that possesses resources.

1.3. Research questions

1.3.1. Primary question

This study will focus primarily on whether it is possible for South Africa and Mozambique to “immunise” themselves against the ARC by encouraging bilateral beneficiation. In order to analyse this primary question, this study shall further focus on secondary questions.

1.3.2. Secondary questions

The secondary questions to answer what the extent of the ARC is; whether beneficiation is a feasible option to address the risk of ARC; whether a state can achieve beneficiation through bilateral agreements and lastly whether beneficiation through bilateral agreement(s) between South Africa and Mozambique is feasible in new projects for the exploitation of shale gas.

1.4. Research objectives

In order to ascertain the answers to the aforementioned research questions, this study shall be subject to the following research objectives so as to achieve the aim of this study:

- Drawing on the assumption that South Africa and Mozambique possess economically viable accumulations of shale gas, examine whether the countries are at risk of the African Resource Curse. The risks herein are therefore simply anticipated but are not tangible due to the fact that the respective sectors are not fully operative as yet. Therefore, aspects relating to beneficiation can only be hypothesised, seeing as a value chain has not been created.
- Examine whether there is a correlation between beneficiation and eradicating the African Resource Curse.
- Examine whether the promotion of beneficiation has a multiplier effect resulting in sustainable development in a host state.
- Obtain insight into the methodology at a State’s disposal to successfully impose beneficiation, specifically by means of its policies and regulatory framework.

- Examine whether meaningful promotion of beneficiation has historically aided sustainable development within a host state.

1.5. Research method

This study does not focus on a literature review of specific authors; but rather aims to approach numerous sources holistically and to create a narrative. Due to the relatively recent exploitation of the shale gas sectors in South Africa and Mozambique, this study will aim to approach the subject matter with fresh eyes focused on the prospect of the relevant emergent shale gas sectors.

The focus of this study shall therefore aim to create a case study focused specifically on the emergent gas sectors of South Africa and Mozambique, the impact of beneficiation spurred by the countries' sectors, and the potential thereof to reduce the risk of the African Resource Curse by implementing beneficiation in these sectors.

1.6. Delineations, limitations and stakeholders

Due to the realistic constraints of this mini-dissertation, this study shall apply the following delimitations and assumptions:

- The accumulations of gas in South Africa and Mozambique qualify as economically viable to exploit;
- There will be no discussion of the technical processes of the Oil and Gas Industry and the exploration phase thereof;
- The main focus will be on the exploitation of shale gas rather than crude oil; however, examples and assumptions will be based on the Oil and Gas sector as a whole.

The focus of the study shall be to explore the benefits of beneficiation for the stakeholders who aim to benefit therefrom down the value chain of the sectors, the multiplier effect on the host country itself, all the while being cognisant of the interests of international role players and foreign investors.

1.7. Chapter overview

In order to study beneficiation as a means to address the ARC, this study will comprise of four chapters dealing with four separate concentrations. The second chapter

focuses on the ARC as a holistic concept as well as the characteristics thereof; factors that attribute to the ARC and a very brief case study example of how the Niger Delta has fallen prey to the ARC.

The third chapter explores the concept of beneficiation, the resource corridor and the implementation thereof in order to address the consequences and threat of the ARC. This chapter also addresses the possibility of implementing beneficiation between South Africa and Mozambique by means of mutually beneficial bilateral agreements between the two states.

The fourth chapter analyses the need for beneficiation in South Africa and Mozambique respectively and the relevant methodologies that can be implemented in order to achieve successful beneficiation through the sectors' value chain by studying their respective regulatory frameworks.

The fifth, and last, chapter shall conclude this study and provide recommendations based on the study, in response to the primary and secondary questions of this paper.

CHAPTER 2:

THE AFRICAN RESOURCE CURSE

2.1. Introduction

This chapter shall explore the concept of the ARC, its impact on African States and whether the consequences of the ARC can be addressed and resolved. The focus will be on African states, with specific inferences drawn in respect of South Africa and Mozambique.

2.2. What is the African resource curse?

One would not be amiss in having the perception that the possession of an abundance of natural resource would be beneficial for the economic development of a state. In the 1950's an abundance of resources were perceived to be an opportunity for a state to develop into a developed country.⁹ However, authors Sachs and Warner after opinions began to arise in the 1980's contrary to the perception of economic benefit, established a negative correlation between an abundance of resources and economic growth in 1995.¹⁰ This conclusion was based on the findings that resource rich countries grew statistically at a slower pace than their resource poor counterparts were.¹¹

The Resource Curse, or the "paradox of plenty" can be defined as a paradoxical state wherein countries who possess an abundance of resources experience a stagnancy or negative economic growth.¹² For purposes of this study, which will focus on Africa and two African states, the term shall be referred to as the African Resource Curse ("ARC").

The root cause of the ARC is twofold. On the one hand, the state is likely to begin to focus in on one single industry only; thereby neglecting their other sectors and becoming too dependent on the one sector.¹³ This phenomenon is also known as the "Dutch

9 B.C. Roy *et al* (2013) 1 *Crt. Urb. Stud's* 148.

10 *Ibid.*

11 *Ibid.*

12 *Ibid.*

13 *Ibid.*

Disease”, which is a subset of the ARC.¹⁴ This results in a dependency on only one product’s commodity price, and having an unstable overall gross domestic product.¹⁵ This lack of diversity and development will inadvertently also kill off other international trading opportunities. The second cause lies squarely with the government of a state, when resource rights, income distribution frameworks (such as local procurement and taxes) are not properly established and administrated; the gap is often filled by corruption and unfair regulation of that industry.¹⁶

We can therefore tell that the presence of the resource abundance is not the curse, but rather the manner in which they are dealt with is the curse. Policy makers should not get caught up in the abundancy of the resources, but ought to view the minerals, as described by Roy *et al*, as “fixed stocks”.¹⁷ The cure therefore, lies with governance, and more specifically governance with the consideration and incorporation of a state’s specific circumstances and individual needs.¹⁸

It is important to note that authors have attributed the ARC to various other causes too, namely economic mismanagement, civil war, internal conflict, reduction of investment in human capital and corruption.¹⁹ However, this study will focus on the twofold causes as described as aforewritten.

The Extractive Industry sectors are fiscally intensive. More often than not, states that possess resources simply do not have the financial means to exploit and extract their resources. Therefore, foreign investors rich in investment potential and knowledge enter the scene by means of their Foreign Direct Investment (“FDI”).

The Fraser Institute, in its 2017 report (“Fraser Report”), assessed the facets that influence investments into exploration. Examples of hurdles for investors are, to name a few: regulatory uncertainty and the administration and interpretation thereof; environmental regulatory uncertainty; inconsistencies and duplications of regulations; the legal system of a specific state; the applicable taxation regime of a particular state; infrastructure; political stability; trade barriers and socioeconomic agreements and

14 Roy (note 9 above) 150.

15 *Ibid.*

16 Roy (note 9 above) 148.

17 Roy (note 9 above) 153.

18 Roy (note 9 above) 154.

19 R. Rwafa (2017) 15 *Com W. Youth Dev.* 3.

community development conditions (These policy factors will hereinafter be referred to as the “deterrents”).²⁰

Whilst these factors and their presence in a host state have the potential to deter investment, one cannot deny the weight of the presence of mineral potential for FDI. In fact, in findings of the Fraser Report, the mineral potential outweighed the aforementioned deterrents.²¹ It was found in the report, that approximately 60% of a FDI investor’s decision is determined by the potential of the mineral deposit, and that the other 40% of the decision is influenced by the deterrents.²² This 60:40 ratio is often not the reality for states that possess very poor policy and a high concentration of the deterrents.²³ Therefore, the conclusion that can be made, is that the less deterrents a state possesses, the more significant a state’s mineral potential has on the decision to invest FDI. For instance, mineral potential in Finland possess a weight of 89.09% of an investor’s decision to invest, whereas South Africa and Mozambique possess scores of 62.06% and 30.78% respectively.²⁴ The investment attractiveness of South Arica and Mozambique are ranked 48th and 87th out of a total of 91 countries globally respectively.²⁵ It is therefore evident that whether or not a project in a host state will be funded is heavily influenced by the mind-set of the investor and the personal risk to the investor. The question therefor arises whether this unavoidable dynamic creates an unfair power balance between the host state (and by extension the economy and citizens of the host state) and the investor. Could this power dynamic result in the ARC?

2.3. What factors can be attributed to the African Resource Curse?

Paul Collier, in his book entitled “The Bottom Billion”, Collier states that (as of the year of publication in 2007) that 80% of the world’s population of 5 billion people live in developing countries,²⁶ but that there are a group of countries in Africa and Central Asia that find themselves living in the 21st century, but with 14th century problems.²⁷ These 14th

20 A. Stedman & K.P. Green (2018) “Fraser Institute Annual: Survey of Mining Companies 2017” *Fraser Institute* 6.

21 (note 20 above) 8.

22 *Ibid.*

23 (note 20 above) 13.

24 (note 20 above) 11 & 13.

25 *Ibid.*

26 As of August 2018, the world’s population is estimated at 7 632 819 325 people. World Population review <http://worldpopulationreview.com/> (accessed 18 September 2018).

27 P. Collier (2007) 3.

century problems are identified by Collier as civil war, plague and ignorance, and those living in those countries and facing these inapt problems are the “bottom billion”.²⁸ Collier further describes these countries as being in a state of war in a chutes and ladders game, wherein these minority countries are stuck in traps and unable to progress due to these traps, namely; the conflict trap, the natural resources trap, the trap of being landlocked with bad neighbours and the trap of bad governance in a small country.²⁹ For the sake of this study, the “trap of resources” will be explored in order to assess whether or not South Africa and Mozambique are at risk of this trap and consequently, the ARC. Collier identifies 58 countries that fall within the bottom billion, but he did not specifically mention the countries in an attempt to doom the wellbeing of these countries.³⁰ It is important to note at this junction that Collier does not consider South Africa as being part of the bottom billion, due to the perception that South Africa is not in a “desperate situation”.³¹ However, in a later publication, Collier lists the bottom billion countries, of which one is Mozambique.³² The Resource Trap that Collier describes is synonymous with the ARC as described in paragraph 2.2 above, but Collier goes further and attributes the trap to politics.³³ When a democracy receives resource rents, the focus is on receiving those rents rather than a focus on developing the state, encouraging diverse investment and not focusing on receiving taxes from its citizens.³⁴ This essentially takes the accountability away from government, and focuses on foreign investors, thereby destroying any electoral competition and government checks and balances.³⁵

It goes without saying that when there is a lack of political development, and an inevitable lack of economic development in the state, that a lack of sustainable development in a state is sure to follow.

It is difficult to tell whether South Africa or Mozambique are indeed susceptible to the ARC with regards to the developing shale gas sectors. Perhaps the easiest way to

28 Collier (note 27 above) 4.

29 Collier (note 27 above) 5.

30 Collier (note 27 above) 7.

31 Collier (note 27 above) 7. This publication was published in year 2007 and since then South Africa has been subjected to legislative uncertainty due to multiple versions of the MPRDA and ancillary mining charters. This lack of certainty has brought about considerable changes to South Africa’s sectors. Perhaps South Africa can now be objectively deemed to be in a “desperate situation”.

32 Collier “Wars, Guns, and Votes: Democracy in Dangerous Places” (2010) 239.

33 Collier (note 27 above) 50.

34 Collier (note 27 above) 51.

35 *Ibid.*

answer this theoretical question is to assess how either state is prepared for oil and gas sectors politically and legislatively. In other words, can it be said that either state can fall into a lack of political development, or are ill equipped to garner as much resources and opportunity out of the exploitation of the shale gas resources? Chapter 4 of this study will encompass a contextualisation of this point by studying each state's respective policies and regulatory frameworks to assess whether South Africa and Mozambique are susceptible to the ARC and whether there is a need to introduce beneficiation tactics to their regulatory frameworks.

2.4. Mini Case Study: Niger Delta and the African Resource Curse

This section will serve as a brief illustration of the ARC and will aim to demonstrate that the ARC is real and needs to be addressed.

When one thinks of oil in Africa, the first state that should come to mind is Nigeria, and this is because Nigeria produces the largest amount of oil in Africa.³⁶ Similarly, Nigeria is also synonymous with the ARC due to the fact that the backbone its economy rests on its oil.³⁷ Almost the entirety of Nigeria's foreign exchange earnings are from oil revenues.³⁸ As the economy is dependent on the rents, taxes and royalties paid by Transnational Oil Companies ("TNOCs"), there is a lack of diversity in their economy and the influence of TNOCs and investors has created conflict and violence in the state.³⁹ In fact, despite the state's enormous abundance of oil, the resource has failed to generate growth economically and has increased the population of its citizens living under the international poverty level a day from 30% of the population before the oil discovery, to 68%.^{40,41}

The majority of the oil is located on and offshore of the Niger Delta.⁴² This region is populated with approximately 20 million people who comprise of diverse ethnic groups

36 K. Omeje (2013) 42 *Afr. Inst.* 92.

37 *Ibid.*

38 K.S.A. Ebeku (2007) 19 *Sri Lanka J. Int'l L* 1.

39 Omeje (note 36 above) 92.

40 *Ibid.*, being less than 1.25 American Dollars a day at the year 2013, the year of this publication.

41 The international poverty line has increased to 1.90 American Dollars a day.
World Bank

<http://www.worldbank.org/en/news/press-release/2015/10/04/world-bank-forecasts-global-poverty-to-fall-below-10-for-first-time-major-hurdles-remain-in-goal-to-end-poverty-by-2030>
(accessed 1 October 2018).

42 Omeje (note 36 above) 92.

comprising of 250 dialects living in approximately 5000 communities.⁴³ The location of the accumulations of oil has given rise to major conflicts and environmental ruin.

In fact, the CIA of the United States of America identified the Niger Delta as a “volatile breeding ground for militant ‘impoverished ethnic groups’ for whom terrorist acts (abduction, hostage taking, kidnapping and extra-judicial killings) were part of their stock and trade”.⁴⁴ The reason for this violence is due to the armed struggle of protecting the oil resources and securing the area by militants and federal forces.⁴⁵ Another source of conflict is the perception that the oil wealth, which is produced from the Niger Delta, is just taken away to other countries and contributing to their wealth and development without themselves reaping such rewards.⁴⁶

The communities along the Niger Delta have further experienced environmental degradation and pollution due to International Oil Companies (“IOCs”) over exploiting the area and having a total disregard for sustainable environmental management.⁴⁷ The Delta’s ecosystem is being devastated by acid rain caused by gas flaring,⁴⁸ oil spills and inadequate waste disposal.⁴⁹ The communities also face the long term effects of oil pollution, namely; loss of biodiversity, the destruction of habitats, fish stock, and water pollution.⁵⁰

The situation in the Niger Delta is further exacerbated by the status of the people who live in the Delta. Approximately 90% of the inhabitants live in very rural communities and these communities tend to avoid “annoying” the foreigners for fear of brutalisation by the police and due to the locals feeling less than, when compared to the foreigners.⁵¹

It is therefore evident that the Niger Delta has arguably suffered from the ARC, as well as environmental and socio-economic degradation. We therefore should ask ourselves how this degradation and lack of development manifested. The answer seems to lie in the fact that the government are stakeholders along with International Oil Companies as well

43 P.E. Ateboh & R.M. Olalekan (2018) 5 *Int’l J. Recent Advances Multidiscip. Res.* 3870.

44 M. Watts (2004) 9 *Geopolitics* 50.

45 R. Dode (2012) 1 *Euro J. Sust. Dev* 235.

46 Dode (note 45 above) 239.

47 Ateboh (note 43 above) 3870.

48 The process of burning natural gas when crude oil is pumped out of the ground. Ateboh (note 43 above) 3878.

49 Ateboh (note 43 above) 3878.

50 *Ibid.*

51 Ateboh (note 43 above) 3882.

as the fact that the relatively new legislation affecting the oil and gas sector are not enforced by regulatory agencies that are independent of the government.⁵²

2.5. Conclusion

The crux of the matter with regards to the ARC, is not a theoretical consideration as to whether the theory of phenomena exists or not, but rather one where realistically there are certain conditions that are prevalent in some states and their sectors that exist wherein there is a risk of a negative economic consequence despite there being objectively positive opportunities for economic growth. These conditions are namely: a developing state having rich resource endowments; poorly implementing or having a lack of governance; the prevalence of a poor regulatory framework and /or having negative governmental interest involvement. As this chapter has illustrated and when considering the Niger Delta as a case study, it is safe to assume that when the aforementioned conditions are prevalent, that the conditions will result or are more likely to result, in the economy of that state either being stagnant and suffering no growth despite the rich endowments or there being a decline in the economy of the state.

Now that the dangers of the ARC have been illustrated, the question arises as to how we address the ARC.

There are other approaches to address the ARC, for example: addressing corruption,⁵³ implementation and compliance with the Extractive Industries Transparency Initiative (“EITI”),⁵⁴ the control of illicit financial flows⁵⁵ and lastly, beneficiation. As evidenced in chapter 1 hereof, this study will study the approach of beneficiation. The following chapter shall focus solely on beneficiation and the African Resource Corridors as a means to address the ARC.

As previously stated, the objective of this study is to create a narrative of the risks that South Africa and Mozambique face in light of the consequences of the ARC, and further that the risk of ARC is associated the manner in which resources are dealt with, rather than the mere presence of an abundance of resources. Therefore, this study will aim to determine whether beneficiation, as a more sustainable method of dealing with resources, can successfully address ARC.

52 Ateboh (note 43 above) 3886.

53 For further reading related hereto: A. Standing (2007) *Inst. Security Studies* 1.

54 For further reading related hereto: C.C. Corrigan (2014) 40 *Resources policy* 17.

55 For further reading related hereto: S. Lemaître (2018) *Crime, Law and Social Change* 1.

CHAPTER 3:

BENEFICIATION

3.1. Introduction

This chapter will delve into the subject matter of beneficiation, its role in the oil and gas sector's value chain, and whether the promotion of beneficiation, also known as "value addition", within a host state can address the ARC. This chapter will further discuss the African Resource Corridor, the United Nations' (the "UN") AMV as well as policy methods to implement value addition.

3.2. What constitutes "Beneficiation"?

As illustrated in the previous chapter, developing countries tend to have its people live in poverty with stagnant or declination in economic development. It is therefore evident that asymmetric distribution of benefits arising from these sectors in host countries are at play.⁵⁶ According to a 2012 United Nations Conference on Trade and Development (the "UNCTAD" paper entitled "Extractive Industries: Optimizing Value Retention in Host Countries", this warped distribution is due to the energy and mining industry conducting their affairs in isolation, and separate from its host state, with little connections to the state's overall economy.⁵⁷ This gap between the profits of the industry and the host state's economic benefit will increase without host state intervention aimed at capturing and retaining value that arises from the industry.⁵⁸

The South African Department of Mineral Resources (the "DMR") has defined beneficiation in its "Beneficiation Strategy for the Minerals Industry of South Africa"⁵⁹ as: "the transformation of a mineral (or a combination of minerals) to a higher value product, which can either be consumed locally or exported. The term is used interchangeably with 'value addition'."⁶⁰

56 United Nations Conference on Trade and Development (2012) 1 ("UNCTAD").

57 *Ibid.*

58 *Ibid.*

59 This strategy was released together with the then relevant South African Mining Charter, dated June 2011.

B. Turok (2014) 55 *New Agenda: S.A. J. Soc. & Econ. Pol.* 47.

(The content of this article was presented to the UN's African Institute for Economic Development and Planning (IDEP) minerals course at the University of Johannesburg on 17 July 2014).

For purposes of this study of the concept of beneficiation, quite literally the progression of creating benefit, the focus is on value addition along the value chain of a resource in order to attain long-term, multiple and diverse value, rather than focusing on “mineral beneficiation” wherein a resource itself is manipulated to create a product of greater value than the resource it is derived from.

Morris *et al* makes the distinction between processing of a mineral and beneficiation of a mineral.⁶¹ According to Morris, processing involves the refining or processing of a resource before it is transferred to user industries (such as processing gold ore and smelting it into bars) and therefore takes place in a “technologically related industry”.⁶² Mineral beneficiation on the other hand, comprises a process of transformation of the resource into an entirely different product which crosses different manufacturing activities (such as gold components being used in electrical semiconductors”.⁶³

In order to achieve beneficiation, one needs to achieve value addition to the value chain, at every different stage of the value chain wherever possible. The extractive industry is characterised as an industry that utilises and comprises different activities from the point of extraction to processing and finally through to consumer utilisation.⁶⁴ These processes occur in host states, but also in states of the operating countries.⁶⁵ For example, crude oil will be exploited in state A, but will be shipped off and refined in country B. It goes without saying that the host state, state A, has therefore lost the opportunity to bear the fruits of the refinery process and has missed an opportunity for value addition in favour of a “global value chain”.⁶⁶

Global value chains and the distribution of wealth along the chain are heavily influenced by the host state’s policies and consequent strategic value distributions and investment decisions.⁶⁷ For example, if state A does not possess the infrastructure required for refinery but also has local policies in place that deters local investment, then an operating company will most likely make a strategic decision to rather not invest in refinery infrastructure, but to rather export the raw resource to another state.

60 Turok (note 59 above) 47.
61 M. Morris *et al* (2012) 24.
62 *Ibid.*
63 *Ibid.*
64 UNCTAD (note 56 above) 3.
65 *Ibid.*
66 *Ibid.*
67 *Ibid.*

3.3. Understanding the Value Chain

The oil and gas industry structure can be grouped into three different segments, namely; upstream activities, midstream activities and downstream activities.⁶⁸ The following figure illustrates these segments (Figure 2).⁶⁹

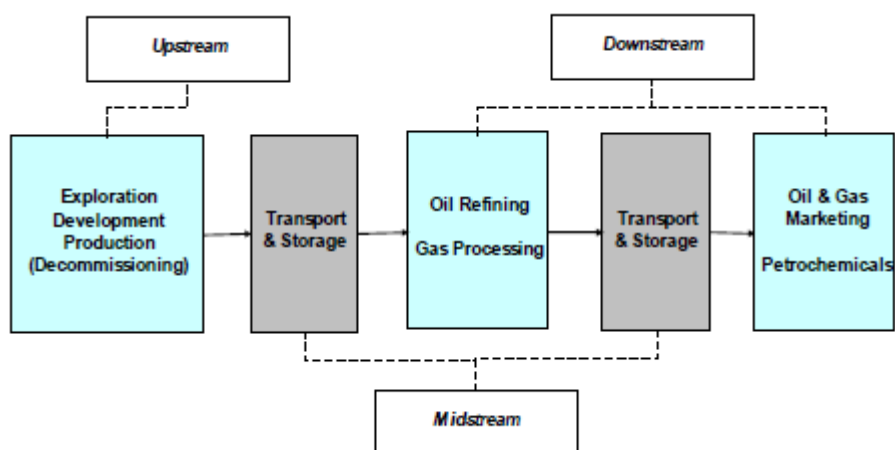


Figure 2: Oil and gas industry structure.⁷⁰

The upstream activities comprises of the exploration phase, the development phase and actual production of the resource.⁷¹ The exploration phase consists of exploration of gas and oil accumulations, as well as an assessment of the quality of the accumulations for purposes of viable exploitation.⁷² The exploration phase is followed by the development phase wherein the project area site is developed to make production possible.⁷³ This phase can take two to four years to complete.⁷⁴ Thereafter, production can begin and usually lasts for a period of fifteen to twenty-five years, depending on the financial viability of the resources.⁷⁵ This phase is followed by the last phase of the upstream activities; decommissioning. The decommissioning phase is characterised by

68 *Ibid.*

69 *Ibid.*

70 *Ibid.*

71 *Ibid.*

72 *Ibid.*

73 UNCTAD (note 56 above) 4.

74 *Ibid.*

75 *Ibid.*

restoring the site to its original state by removing buildings and equipment and restoring the site environmentally subsequent to the commercial exploitation.⁷⁶

Midstream activities are characterised by the assets and services that support the upstream activities and provide a link between supply of the oil and gas, and the demand of its products from the consumer.⁷⁷ These activities include transportation and storage of the resource in its raw form as well as the processed product.⁷⁸

Downstream activities are characterised by processing and refining activities.⁷⁹ The refining and processing is followed by marketing the now final oil and gas products (these products will now fall within the petrochemical industry) for consumption by consumers.⁸⁰

The concept of beneficiation, also referred to as “value addition” can, according to Ben Turok,⁸¹ be approached with three linkages that are connected to the practicality of the utilisation of minerals, namely; input linkages, forward linkages and lateral linkages.⁸²

The input linkages consist of those activities that result in the resource being brought up to the surface and processed to an intermediary level; the forward linkages are the activities that lead to fabrication of the resources, and lastly, the lateral linkages consist of training and all the services that are coincidental to and accompany the entire value chain.⁸³

Beneficiation therefore encompasses an exercise of understanding a resource-specific value chain and adding further value to it. The shale gas value chain can be illustrated and put into perspective by the following illustration hereunder (Figure 3):

76 *Ibid.*

77 *Ibid.*

78 *Ibid.*

79 *Ibid.*

80 *Ibid.*

81 Ben Turok is a director of the Institute for African Alternatives (IFAA).

82 Turok (note 59 above) 47.

83 *Ibid.*

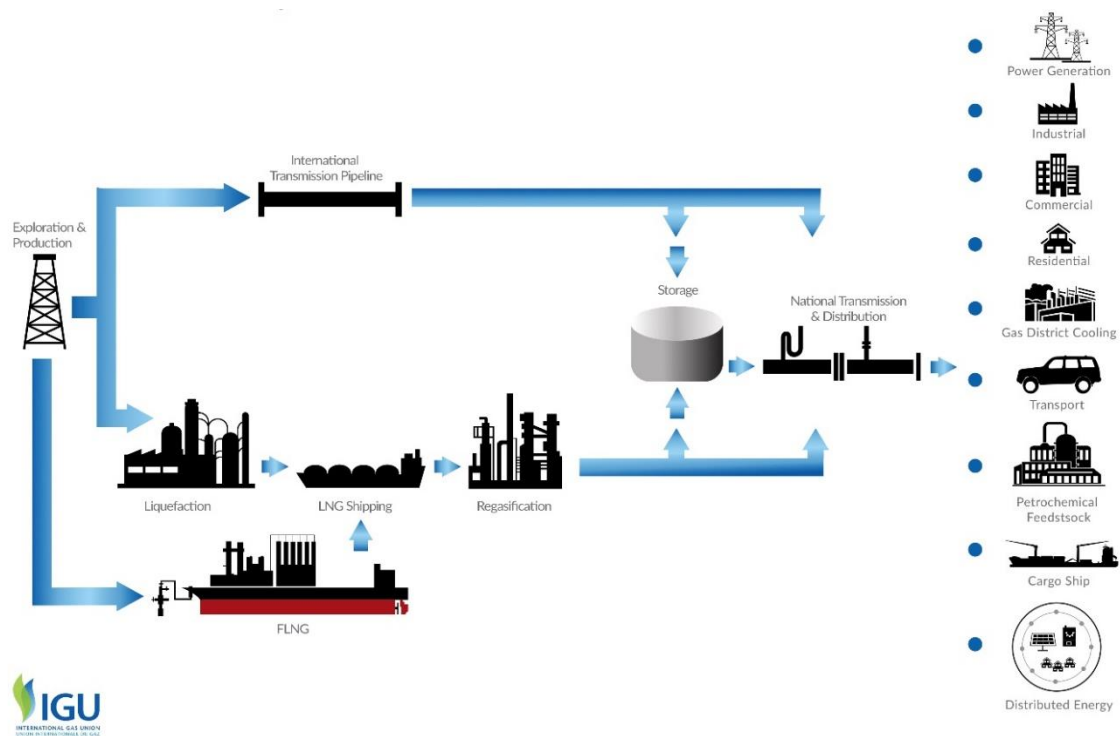


Figure 3: Gas industry value chain ⁸⁴

From the illustration hereabove it is evident that there are many junctures within the oil and gas value chain, throughout each stream. The concept of beneficiation, or value addition, aims to “take advantage of” and add value, wherever and however possible, at each junction. The ideal opportunity to create beneficiation in favour of a host state would therefore be one where instead of raw ore being transported out of the host state to be refined and sold in another state, that that ore be retained, refined, transported and sold within the host state (or between two states in order to achieve mutually beneficial beneficiation) in order to bear a greater value which is more sustainable and creates ancillary industries within the host state.⁸⁵

It is further evident from Figure 3, that the gas supply chain is plugged into several different economic sectors, and as such there are objectively various supply chain opportunities which can be built around the gas industry. The process of moving away from the concentration of just one economic activity (such as the case in the Niger Delta as described in paragraph 2.3 *supra*) by means of encouraging the development of further

⁸⁴ The International Gas Union “The Gas Industry Value Chain” <https://www.igu.org/dialog-sidebar/gas-industry-value-chain> (accessed 7 October 2018).

⁸⁵ UNCTAD (note 56 above) 45.

supply chain opportunities is in itself a positive move away from the perils of the ARC, and towards broader economic growth, and ideally, meaningful sustainable economic development of the host state.

3.4. The Africa Mining Vision

The concept of beneficiation is not a new concept and has been studied as part of the jurisprudence of international law. There is a progression in recognising that Africa, and its states, need to utilise their natural resources in a productive and sustainable manner for the benefit of its people, this is the future that the AMV aims to achieve.⁸⁶ The AMV was jointly established by the African Union (“AU”), of which South Africa and Mozambique are members,⁸⁷ and the Economic Commission for Africa (“ECA”) for purposes of addressing Mineral Resources Development in Africa.⁸⁸ Without going into unnecessary detail regarding the AMV, the AMV recognises that governments as key stakeholders, need to be proactive and take deliberate steps to:

*“Promote local beneficiation and value addition of minerals to provide manufacturing feedstock”.*⁸⁹

The AMV further makes the case for optimising the licensing of a host state’s resources at the commencement of a project as material amendments with license holders (who will most likely be international organisations in the emergent shale gas sectors) after the conclusion of exploitation contracts will be difficult and will also break away at the relationship of the FDI investors and the host state.⁹⁰ Therefore, the AMV suggests that all critical resource linkages should be identified prior to the conclusion of any contracts, leases or licences.⁹¹ There are several aspects which the AMV deems prudent in this regard, to name a few: which includes providing third-party access to resource infrastructure; development of local supply sector; and “The establishment of resource processing industries through the use of flexible value-addition (beneficiation)

86 F. H. Acyl (2015) 57 *New Agenda: S.A. J. Soc. & Econ. Pol.* 51.
(The content of this article is an excerpt of Acyl’s speech to leaders of Africa’s private-sector mining industry at the 2015 Mining Indaba in Cape Town on 9 February).

87 African Union “Member States”
<https://au.int/en/memberstates> (accessed 15 October 2018).

88 African Union “Africa Mining Vision” (2009) 1 (“AMV”).

89 AMV (note 88 above) 3.

90 AMV (note 88 above) 17.

91 *Ibid.*

milestones & incentives and the upfront stipulation of competitive pricing of resource outputs/products in the domestic market, for the life of the project”.⁹²

With regards to the question of the factors that would harm the AMV’s vision for the utilisation of resources in a sustainable manner (*i.e. avoiding the ARC*) one of the factors that the AMV identifies is that of downstream value addition.⁹³

3.5. Implementation methodology of beneficiation

Morris *et al*, similarly to Ben Turok (in paragraph 3.2 supra) explores the linkages that exist in the extractive industries. Three relevant overarching branches are identified, namely fiscal, consumption and production linkages.⁹⁴

Fiscal linkages consist of resource rents that governments can accrue by means of corporate and income tax as well as royalties on the resources. These monies in the state’s fiscal can be utilised to develop industrial development in various sectors.⁹⁵ The consumption linkages are characterised by other sectors which do not create commodities, needing to support the sectors that do create commodities and due to the type of expenses commodity sectors incur.⁹⁶ The third linkage is production linkages (as discussed in paragraph 3.2 supra) which is split into three classes, namely: forward (processing and manufacturing); backward (producing input components that will be used in other commodities) and lastly horizontal linkages (characterised by a network of linkages between suppliers and users of the value chain and who can add services, technology or input into the value chain).⁹⁷

Governmental policies which do not support the extractive industries and the inherent specialist services and equipment necessary to support the industry will suffer with a lack of efficacy and will stagnate.⁹⁸ Similarly, when a state’s policies are perceived in a negative light, the outputs of the extractive industry will diminish. Morris states that this is the case of South Africa where its policies are perceived to be uncertain (specifically with regards to land rights and the promotion of programmes for black empowerment), national

92 AMV (note 88 above) 17-18.
93 AMV (note 88 above) 14.
94 Morris (note 61 above) 24.
95 *Ibid.*
96 *Ibid.*
97 *Ibid.*
98 Morris (note 61 above) 181.

corruption and threats of nationalisation.⁹⁹ It goes without saying that these outcomes and symptoms of poor policy are against value addition and the strive towards sustainable development of the extractive industry.

In order to achieve beneficiation of a resource along a host state's value chain, one needs to assess the linkages of the value chain and identify the opportunities that arise at each link and how value can be added to the linkages, value chain and consequently, the specific sector.

Once the stakeholders can identify opportunities to add value and achieve beneficiation, these values need to be retained. It goes without saying that states that possess rich resource endowments should seek to leverage these endowments by achieving the goal of "local content" by developing conditions (these conditions can be developed by means of policy, legislation, trade agreements, *etc.*) that create production of forward and backward linkages, as well as cultivating horizontal linkages between the extractive industries and the other industries that make up the local economy of the host state.¹⁰⁰

In order to cultivate the conditions necessary to grow local content, the UNCTAD has identified four challenges which ought to be addressed by a host state, but which are long term attainable goals, these are namely; lack of human capacity and education skills, poor infrastructure, weak industrial base and lastly poor governance.¹⁰¹

3.5.1. *Human capacity and education*

Local content policies should take the reality of their people's education and skill set into account when designing their policies.¹⁰² A skilled and aptly experienced work force is integral to the development of a state's industry.¹⁰³ However, the reality is that host countries may not have access to a sufficient skilled work force.¹⁰⁴ The lack of a skilled work force is a double edged blade as the host state does not enjoy a higher rate of employment and local incorporation, and conversely international operating companies

99 *Ibid.*

100 UNCTAD (note 56 above) 17.

101 *Ibid.*

102 *Ibid.*

103 *Ibid.*

104 *Ibid.* This could be for a number of reasons, but UNCTAD identifies four main causes in respect of the shortage of skilled works in the oil and gas industry, namely: 1. Scarce educational facilities; 2. Weak vocational and technical training; 3. Lack of school accreditation; 4. Increasing demand for higher skilled workers in the industry.

who run high risk projects cannot afford delays which may be caused by unskilled labourers.¹⁰⁵ All is however, not lost, as host states can address their skills shortage by building their local capacity through creating an education base that addresses long-term development, and by encouraging direct participation of local workers with companies that are in the industry's value chain and thereby encouraging skills training in the short-term.¹⁰⁶

States can further adopt policies that ensure that international companies that operate in their state contribute to skills development and educational programmes.¹⁰⁷

3.5.2. *Infrastructure*

Poor infrastructure has the potential of being the weakest link or breaking point at every avenue of a value chain and further hampers expansion of the industry and manufacturing and over downstream activities.¹⁰⁸ The standard of infrastructure of a state is further an important facet that investors look at when considering the feasibility of a project, the value of a project, and their overall decision to invest or not.¹⁰⁹ Poor infrastructure further influences the costs of goods and therefore has the potential to impact its people negatively by subjecting them to a high cost of living and poor access to services.¹¹⁰ In order to address a lack of infrastructure, UNCTAD recommends that host states focus on enacting appropriate legal, institutional and regulatory framework(s); managing different avenues of private involvement of financing infrastructure projects; seeking FDI through investment promotion agencies; and lastly to incorporate local social factors related to investment in infrastructure.¹¹¹

3.5.3. *Industrial base*

Local content can only be realistically achieved in the realm of its existing local capabilities in manufacturing and supporting services.¹¹² This industrial base is essentially the foundation that the value chain is built upon. A healthy industrial base is one that is

105 *Ibid.*
106 *Ibid.*
107 *Ibid.*
108 *Ibid.*
109 UNCTAD (note 56 above) 18.
110 *Ibid.*
111 UNCTAD (note 56 above) 19.
112 UNCTAD (note 56 above) 21.

wide, has access to technology, financing, and information and is competitive in the international industry.¹¹³

In order to develop an industrial base, a state should develop a clear industrial policy that is in line with a development strategy that promotes interaction of all stakeholders throughout the value chain of a sector and would therefore invariably include private and public stakeholders with the aim of establishing concise incentives which are linked to real capabilities and that have active time lines.¹¹⁴

3.5.4. *Good governance and proper business environment*

In order to achieve sustainable development gains, states cannot merely rely on their rich endowments, but must further ensure that they possess a business environment that stimulates domestic business creation and growth.¹¹⁵ Additionally, state policies ought to be aimed at long term gains and development, encouraging state accountability and a focus on the interests of a host state's population as a whole.¹¹⁶

Host states should further provide a legal, regulatory and institutional framework that incentivises investment and development in production activities while simultaneously providing local guarantees to prevent corruption and resource rent seeking behaviour.¹¹⁷

Vital elements of governance that supports development of sound local content in the extractive industries include the following:

- a legal framework that establishes clear ownership and rights;
- establishing transparent and independent regulatory powers that are separate from property operating activities;
- establishing a concise fiscal and administrative framework for the extraction of resources;
- establishing a system of revenue management that governs the sharing of and distribution of resource rents;
- establishing clear regulation of worker's rights, health and safety and the protection of the environment as well as the rights of local communities affected by extractive industry projects.¹¹⁸

113 *Ibid.*

114 *Ibid.*

115 UNCTAD (note 56 above) 22.

116 *Ibid.*

117 *Ibid.*

3.6. Conclusion

This chapter explains the concept of beneficiation, and more specifically what beneficiation by means of value addition throughout a value chain is, and what it could potentially be. International law sources (the AMV and UNCTAD) were relied upon in this chapter in order to illustrate both the recognition of value-added beneficiation internationally, but also to add weight to the aversions as to the disparity of distribution of benefits in host countries, the indicators thereof, as well as methods that can be utilised to address value added beneficiation.

Further, the value chain and its various segments and linkages was discussed with the aim of illustrating the scope of applying value added beneficiation to a value chain. It is therefore evident that there are multiple linkages that need to be explored, identified and developed by a state in order to achieve beneficiation.

This chapter further illustrated that beneficiation can be attained by assessing value chain linkages and identifying both opportunities and weaknesses at various linkages and value chain junctures. When a state can enforce conditions that are developed and attract horizontal linkages between the extractive industry and other industries, a state enjoys local content. The development and implementation of sound governance is required to enforce and retain local content.

The subsequent chapter provides an overview of the context of the oil and gas sectors in South Africa and Mozambique respectively by studying their current economic environment and regulatory framework, and further contextualises the study by briefly discussing Mineral Clusters and Resource Development Clusters.

CHAPTER 4:

CONTEXTUAL STUDY OF THE OIL AND GAS SECTORS OF SOUTH AFRICA AND MOZAMBIQUE

4.1. Introduction

This chapter's aim is to contextualise the emergent shale gas sectors in South Africa and Mozambique independently, but also bilaterally. In order to achieve this contextualisation, each state will be studied individually. Each state's current economy will be briefly assessed as well as establishing the current potential oil reserves of each country, compared to the amount of Gross Domestic Product the extractive industry generally and the oil and gas sectors generate respectively.

This chapter will further examine the regulatory frameworks currently in place in South Africa and Mozambique. This chapter will also delve into research that has been done on mineral clusters between South Africa and Mozambique, as well as the concept of Resource Corridors and how these ancillary concepts could perhaps drive beneficiation in each state as well as mutual bilateral beneficiation.

4.2. Analyses of the Regulatory Framework of South Africa

South Africa's oil and gas sectors are fairly underdeveloped with only moderate exploration activities having taken place.¹¹⁹ South Africa only has an estimated 13.8 million barrels (bbl) of proven oil reserves, and 28.8 billion cubic meters (bcm) of proven gas reserves according to recent BMI Research findings.¹²⁰

4.2.1. *The economy of South Africa*

South Africa has historically been shaped and developed through its extractive industries and has consequently resulted in ancillary industries being created and developed.

119 ICLG "International Comparative Legal Guide to: Oil & Gas Regulation 2018" *Chapter 24 – South Africa* (2018) 236
<https://iclg.com/practice-areas/oil-and-gas-laws-and-regulations/south-africa> (accessed on 15 October 2018). ("ICLG S.A.").

120 *Ibid.*

By way of example,¹²¹ in 1873, gold was discovered in the village now known as Pilgrim's Rest in the province of Mpumalanga, South Africa.¹²² As a result of this gold rush, alluvial gold panning as well as underground mining took place in the village and its surrounds. Due to the influx of people and the new industry, towns began to develop around Pilgrim's Rest. The town of Sabie (approximately 34km's from Pilgrim's Rest) came to be due to its favourable climate for forestry and the mines in Pilgrim's Rest requiring timber.¹²³ Additionally, trade routes began to develop from the Pilgrim's Rest area to Delagoa Bay (which is now known as Maputo, Mozambique) and one of the key areas for the railway *en route* to Delagoa Bay was in Nelspruit, now known as the City of Mbombela (approximately 95 km's from Pilgrim's Rest) and which is now the provisional capital of Mpumalanga.¹²⁴

South Africa as a whole has also followed this trend of attracting ancillary and supportive sectors. South Africa's economy might have been built on its mining industry, but today other and more diverse industries and industries that came to be as ancillary industries to mining are carrying our economy.¹²⁵ In fact, the Mineral Council of South Africa ("MCSA") (formerly known as the "Chamber of Mines") estimates that the mining sector contributed only 6.8% of South Africa's overall Gross Domestic Product ("GDP"), with a total of R335 billion (Three Hundred and Thirty-Five Billion South African Rand) contribution to South Africa's GDP.¹²⁶ Unfortunately, the MCSA does not have statistics on the oil and gas sectors in South Africa, but only addresses the amount of royalties gained, however, the MCSA has grouped oil and gas with other commodities such as chrome, fluorspar, nickel phosphates and vanadium, and the MCSA estimated that these sectors have contributed 16.1% of mining royalties paid in the year 2017.¹²⁷

121 This example is based on the writer hereof's personal knowledge owing to the fact that the writer grew up in Pilgrim's Rest and based on the discussions between herself and an archaeologist based in Pilgrim's Rest, a certain Mrs Irene Reinders.

122 Pilgrim's Rest history
<http://www.pilgrims-rest.co.za/history/> (accessed 16 October 2018).

123 SA History "Colonial History of Nelspruit"
<https://www.sahistory.org.za/topic/colonial-history-nelspruit> (accessed 16 October 2018).

124 Sabie Poles "Origin of Forestry in Sabie: the forester, the history and more"
<https://www.sabiepoles.co.za/origin-of-forestry-in-sabie-the-forester-the-history-and-more/> (accessed 16 October 2018).

125 Minerals Council South Africa "Facts and Figures 2017" (2018) 3
<http://www.mineralscouncil.org.za/downloads/send/18-current/634-facts-and-figures-2017> ("MCSA").

126 MCSA (note 125 above) 6.

127 MCSA (note 125 above) 19.

The oil and gas sectors in South Africa are primarily governed by the Minerals and Petroleum Development Act (“MPRDA”).¹²⁸ Resources are by virtue of the MPRDA property of the people of the state and the state, and more specifically the Minister of Resources, acts as the custodian of the resources on behalf of the state’s people and is the body responsible for issuing permits and licenses.¹²⁹ It is however, important to note that the MPRDA does not include shale gas in its definitions clause, and that it further specifically excludes shale gas in its definition of “petroleum” by reading as follows:

“petroleum’ means any liquid, solid hydrocarbon or combustible gas existing in a natural condition in the earth’s crust and includes any such liquid or solid hydrocarbon or combustible gas, which gas has in any manner been returned to such natural condition, but does not include coal, bituminous shale or other stratified deposits from which oil can be obtained by destructive distillation or gas arising from a marsh or other surface deposit.”¹³⁰

Although South Africa’s main source of energy is coal,¹³¹ the availability of natural gas in Mozambique (and oil which is mainly exported to South Africa)¹³² and South Africa’s own discoveries of offshore gas reserves is projected to be an additional source for South Africa’s energy needs.¹³³ It is evident that there is an active, albeit it perhaps relatively slow, development of South Africa’s oil sector which is illustrated by the South African government drafting a National Gas Infrastructure Plan to develop infrastructure to accommodate future gas market developments, as well as continuous exploration for gas throughout the state, as well as actual commercial production at the Bredasdorp Basin.¹³⁴

Furthermore, there are currently national pipelines run by a parastatal of the South African government,¹³⁵ which comprises of a 3000 km petroleum and gas pipeline, as well

128 Act 28 of 2002.

129 ICLG S.A. (note 119 above) 237.

130 Section 1 of Act 28 of 2002.

131 ICLG S.A. (note 119 above) 236.

132 ICLG “International Comparative Legal Guide to: Oil & Gas Regulation 2018” *Chapter 19 – Mozambique* (2018) para 2.1.

<https://iclg.com/practice-areas/oil-and-gas-laws-and-regulations/mozambique> (accessed 15 October 2018) (“ICLG Moz”).

133 ICLG S.A. (note 119 above) 236.

134 *Ibid.*

135 Namely, Transnet, which owns, manages and maintains the high-pressure pipelines on the government’s behalf.

as the existence of the Rompco pipeline between South Africa and Mozambique.¹³⁶ It is important to note that the Rompco pipeline is owned, operated and constructed by private companies, subject to South African licenses and legislation and is supported by a state owned company, namely “iGas”, which holds equity in the pipeline.¹³⁷

The Petroleum Oil and Gas Corporation of South Africa (“PetroSA”) began operating the world’s first gas-to-liquid (“GTL”) refinery in 1992 at Mossel Bay.¹³⁸ This type of refinery refines natural gas into liquid synthetic fuels which is obviously of great value in the energy sector.¹³⁹ The Mossel Bay GTL refinery is currently the third of only 5 GTL refineries in the world.¹⁴⁰ Mozambique does not have a GTL refinery, but there are currently plans to initiate feasibility studies to potentially build Mozambique’s own GTL plant.¹⁴¹

It is therefore evident that South Africa, although it does not have enormous gas reserves of its own, South Africa has much to offer Mozambique by way of infrastructure and support.

It is further evident that the South African government has taken steps to support the emerging gas sectors. The question however, is whether the South African government can do more to add value to the emerging sector.

4.2.2. Value derived from oil and gas sectors

South Africa currently derives value from its oil and gas sectors by means of the imposition of royalties when minerals are “transferred” by means of disposal or consumption;¹⁴² through taxation of income,¹⁴³ capital gains,¹⁴⁴ and value added tax;¹⁴⁵ through requiring permits for the exportation of petroleum products and lastly by ensuring

136 ICLG S.A. (note 119 above) 236.

137 ICLG S.A. (note 119 above) 239-240.

138 ICLG S.A. (note 119 above) 236 & PetroSA
<http://www.petrosa.co.za/Pages/Home.aspx> (accessed 19 October 2018).

139 Petro SA
http://www.petrosa.co.za/innovation_in_action/Pages/GTL-TECHNOLOGY.aspx (accessed 19 October 2018).

140 *Ibid.*

141 Sasol
<https://www.sasol.com/mozambique> (accessed 19 October 2018).

142 Mineral and Petroleum Resources Royalty Act 28 of 2008.

143 Income Tax Act 58 of 1962.

144 *Ibid.*

145 Value Added Tax Act 89 of 1991.

that financial guarantees are furnished for proposed development commitments in light of gas developments.¹⁴⁶

4.2.3. *South Africa's Regulatory Framework*

Despite South Africa's government taking the aforementioned steps in favour of the emergent South African shale gas sector, there is a glaring lack of legislative uncertainty in respect of shale gas. The MPRDA has been subject to an amendment Bill which has been in the pipeline since the year 2013,¹⁴⁷ and to date hereof is yet to be enacted.¹⁴⁸ Further to the problem of awaiting the amendment, there are material aspects of the Bill which have further been criticised, including the addition of a requisite 20% free carried interest in favour of the state for gas and petroleum exploration activities;¹⁴⁹ there is still no shale gas definition provided in the Bill;¹⁵⁰ state free carry includes interest at the exploration phase and lastly that the Black Economic Equity ("BEE") participation does not reflect state carried participation interest and does not correspond in comparison to mining of minerals, to the level of commercial risk and greater long term investment requisites of the shale gas sector.¹⁵¹ It is trite that legislation and a fiscal framework that ensures clear, attractive and stable outcomes over the entire lifetime of a project will attract and retain foreign investment.¹⁵²

It is therefore of paramount importance for the sake of the future of South Africa's gas sector, that it addresses its legislative uncertainty and further ensures the correct balance of state participation in shale gas projects in order to both please investors, but also to ensure national beneficiation.

4.3. **Analyses of the Regulatory Framework of Mozambique**

Mozambique has, according to the Mozambican National Petroleum Institute, proven natural gas reserves of over 100 trillion cubic feet (2.83 trillion cubic meters).¹⁵³

146 ICLG S.A. (note 119 above) 238-239.

147 Mineral and Petroleum Resources Development Amendment Bill [B 15—2013].

148 ICLG S.A. (note 119 above) 244.

149 W. du Plessis (2015) 18 *PELJ* 1447.

150 SAOGA (note 1 above) 18.

151 *Ibid.*

152 SAOGA (note 1 above) 17.

153 ICLG Moz (note 132 above) para 1.1.

4.3.1. *The economy of Mozambique*

Mozambique's economy is strengthened due its strategic location of being surrounded by four landlocked states relying on Mozambique's approximately 2 500 km long coastline for channel to global markets.¹⁵⁴

In assessing Mozambique's current economic status, one ought to keep in mind that Mozambique's civil war ended a mere twenty-six years ago in 1992,¹⁵⁵ and as such the economy is still restoring and rebuilding itself. Mozambique has been fortunate to receive substantial foreign aid, and as such this influx of monies and subsequent debts have skewed the economy's numbers.¹⁵⁶

The vast majority of the population of Mozambique live in rural areas (approximately 68% of the population),¹⁵⁷ and 75% of the population's work force being employed in Agriculture which contributes to 21% of the state's GDP.¹⁵⁸ Mozambique's GDP is steadily improving, with the extractives sectors acclaimed for its drive due to the sizeable influx of FDI and commodity prices recovering.¹⁵⁹ Mozambique's Director-General of Taxes announced on 28 February 2018 that the taxation on the extractive industry contributes 4.1% of Mozambique's GDP.¹⁶⁰

South Africa is currently keeping a curious eye on Mozambique's gas sector, due to its potential for South African gas imports and opportunities that may arise therefrom in South Africa's favour.¹⁶¹ SAOGA's CEO, Mr Niall Kramer has gone so far as to state that

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- 154 The World Bank "The World Bank in Mozambique"
<https://www.worldbank.org/en/country/mozambique/overview> (accessed 19 October 2018).
- 155 Deloitte "Mozambique's Economic Outlook: Governance challenges holding back economic potential" (2016) 2.
https://www2.deloitte.com/content/dam/Deloitte/za/Documents/africa/ZA_Mozambique%20country_report_25012017.pdf (accessed 19 October 2018) ("Deloitte").
- 156 Deloitte (note 155 above) 4.
- 157 Deloitte (note 155 above) 2.
- 158 The World Bank "Mozambique Economic Update, a Two Speed Economy"
<http://documents.worldbank.org/curated/en/790351501245021584/pdf/117784-REVISED-MEU-2017-English-Digital-Version.pdf> (accessed 19 October 2018) ("Two Speed Economy") 4.
- 159 *Ibid.*
- 160 Club of Mozambique "Extractive industry contributes 4.1 percent of GDP"
<https://clubofmozambique.com/news/extractive-industry-contributes-4-1-percent-of-gdp/> (accessed 19 October 2018).
- 161 Engineering News "Saoga upbeat about prospects for the gas industry in South Africa"
http://www.engineeringnews.co.za/article/saoga-upbeat-about-prospects-for-the-gas-industry-in-south-africa-2018-10-19/rep_id:4136 (accessed 19 October 2018).

SAOGA predicts that Mozambique's gas discoveries have the potential of doubling the Mozambican economy.¹⁶² It is interesting to note that SAOGA, a South African agency, avers that 200 trillion cubic feet of gas has been discovered,¹⁶³ whereas the Mozambican National Petroleum Institute avers that "over 100 trillion cubic feet of gas has been discovered."¹⁶⁴

South Africa currently constitutes approximately 24% of Mozambique's bilateral trade, making it Mozambique's largest trade partner.¹⁶⁵ South Africa is further expected to be Mozambique's biggest importer of liquid natural gas.¹⁶⁶

Sasol, a South African company, operates on the onshore fields in Pande and Temane in the South of Mozambique and exports the gas to South Africa via pipeline.¹⁶⁷ Massive reserves have recently been discovered in the Rovuma Basin, which has attracted multinational oil and gas companies who are currently investing in prospecting and shortly in other upstream activities such as the construction of platforms and drilling in the Rovuma Basin.¹⁶⁸ As aforementioned, Mozambique does not have a LNG refinery as yet, however, feasibility studies are currently underway to develop Africa's first floating LNG refinery facility which is estimated to produce 20 million tonnes per annum as of the year 2023.¹⁶⁹ Gas storage facilities will most likely only be constructed once the production of offshore gas commences.¹⁷⁰

Oil production has not yet commenced in Mozambique, however the production of the oil will be managed and exported to Sasol in South Africa.¹⁷¹ Similarly, the vast majority (82%) of Mozambique's natural gas is currently exported to South Africa.¹⁷²

It is therefore evident that there is a trend and an established bilateral relationship between South Africa and Mozambique wherein oil and gas is exploited in Mozambique, subsequent to which it is exported, transported and refined in South Africa. Does this bilateral relationship exploit Mozambique?

162 *Ibid.*

163 *Ibid.*

164 ICLG Moz (note 132 above) para 1.1.

165 Deloitte (note 155 above) 20.

166 *Ibid.*

167 ICLG Moz (note 132 above) para 1.1.

168 *Ibid.*

169 *Ibid.*

170 *Ibid.*

171 ICLG Moz (note 132 above) para 2.

172 ICLG Moz (note 132 above) para 1.4.

Mozambique arguably does not have its own infrastructure and facilities to support midstream and downstream activities (yet) and as such Mozambique is reliant on South Africa. However, South Africa's gas sectors and ancillary sectors are similarly reliant on Mozambique's oil and gas at least until South Africa starts exploiting its indigenous oil and gas reserves.

4.3.2. *Value derived from oil and gas sectors*

Oil and gas projects are operated in terms of concession agreements in Mozambique, and as such the state may impose finance obligations in terms of the concession agreements which will benefit the state.¹⁷³ Entities who are party to concession agreements are further subject to income tax, value added tax and the specific petroleum tax regime that levies a "production tax" on the oil and gas that is produced in specific concession areas.¹⁷⁴

It is important to note that South Africa follows a license-based system in respect of its minerals and resources, and as such does not enjoy the aforementioned value derivatives.

4.3.3. *Mozambique's Regulatory Framework*

Mozambique's Constitution mandates that all of its resources are classified as property of the state,¹⁷⁵ and further, that the Ministry of Natural Resources is the body responsible for the affairs and implementation of the "governmental natural resource policies" and to further supervise the National Petroleum Institute which is the current regulatory authority that administers and promotes petroleum operations.¹⁷⁶ Additionally there are bodies that are created (and in some instances solely envisioned) by statute in order to oversee and supervise bodies and sectors, namely: the "High Authority of the Extractive Industry" to supervise the National Petroleum Institute;¹⁷⁷ and the Energy

173 ICLG Moz (note 132 above) para 3.5. These obligations can include bonus payments payable to the state, training programmes and relinquishment funds.

174 ICLG Moz (note 132 above) para 3.5.

175 Constitution of the Republic of Mozambique.

176 ICLG Moz (note 132 above) para 3.1. The National Petroleum Institute which regulates the administration and promotion of petroleum-based operations, is empowered by Mozambique's Decree 25 of 2004.

177 *Ibid.* However, it is important to note that the "High Authority" body is not operational as yet.

Regulatory Authority which is mandated to equate, control and supervise the energy sector as a whole in Mozambique.¹⁷⁸

The legislative regulation of petroleum in Mozambique is intended to entice competitiveness and transparency in the sector, with an additional aim to enforce the State's role to achieve protection and involvement of its people.¹⁷⁹

4.4. Mineral Clusters and Resource Development Corridors

The purpose of this paragraph is merely intended to illustrate further relationship pathways between South Africa and Mozambique in order to explore the concept of bilateral beneficiation between the states, and as such, these paragraphs are in no way intended to be concise discussions on the respective concepts.

4.4.1. Minerals Cluster Policy Studies of South Africa and Mozambique

Essentially, a “cluster” can be defined as:

“...a concentration of expertise among closely linked industries and companies in which extensive investment in specialized factors of production catalyzes a growth trajectory. The emphasis is on the linkages that arise because of mutual connections and interaction between individual industries and with associated institutions. Clusters arise through the flow of information or products between companies that are functionally linked together.”¹⁸⁰

The purpose and advantage of studying by means of clustering is that instead of analysing an industry through the lens of the economy it finds itself in, whereby one isolates the industries from one another and merely links the industry through immediate flows of goods and materials, one rather analyses the focus on linkages and interdependencies of the various actors in a value chain.¹⁸¹ The overall goal of clustering is to generate additional national and foreign exchange revenues; increase exports,

178 ICLG Moz (note 132 above) para 3.1. Implemented by means of Law no. 11/2017, September 8.

179 ICLG Moz (note 132 above) para 3.1.

180 United Nations, Economic Commission for Africa (2004) 25 (“ECA”).

181 ECA (note 180 above) 27.

create global competitiveness and productivity and to further achieve regional economic stability and higher standards of living.¹⁸²

The Economic Commission for Africa studied the mineral cluster of South Africa and Mozambique specifically and came to the finding that cluster development strategies which are centred around natural resources have the potential to create sustainable economic development and provide a catalyst for greater productivity.¹⁸³

4.4.2. *Resource Development Corridors*

The concept of a Resource Development Corridor (a “RDC”) is not one of simply allowing trade from an enclaved state to coastline through simple transportation.¹⁸⁴ The aim of a RDC is rather to allow for opportunity and economic growth through the transportation, transfer and trade of goods and resources which in turn facilitates cohesive trade systems, improved infrastructure and a smoother cross-border stream of goods.¹⁸⁵

The South African Development Community (“SADC”) states, of which South Africa and Mozambique are members of, have identified twelve RDCs, one of which, and arguably, the most successful being the “Maputo Development Corridor”.¹⁸⁶ The Maputo Development Corridor connects South Africa and Mozambique to one another. By road the RDC is located from the South African provinces of Gauteng and Mpumalanga, to the Maputo harbour.¹⁸⁷ There is further a railway system that also connects South Africa and Mozambique, but that is also further interlinked to Zimbabwe and Swaziland.¹⁸⁸

The Maputo Corridor has, and continues, to allow for ease in reaching the border of Maputo from the inland provinces of South Africa; safety and reliability in passage between the borders; increase in tourism in Mozambique; improvement in and quality of infrastructure; as well as reduced operational ineptitudes.¹⁸⁹

182 *Ibid.*

183 ECA (note 180 above) 145.

184 C. Bowland & L. Otto (2012) 54 *Policy Briefing* 1.

185 Bowland (note 184 above) 2.

186 Bowland (note 184 above) 1.

187 Sequeira *et al* (2014) *SSATP* 26.

188 Sequeira (note 187 above) 29.

189 Bowland (note 184 above) 3.

4.5. Conclusion

This chapter contextualises the emergent shale gas sectors of both South Africa and Mozambique.

South Africa has comparably low proven gas reserves when compared to Mozambique but has stronger and more established midstream and downstream facilities in comparison to Mozambique. Additionally, Mozambique faces the hurdle of having the majority of its citizens living in rural areas and being primarily skilled in agricultural activities. South Africa on the other hand, has an entrenched history in the extractive industries and as such will invariably possess a more aptly educated workforce and due to its higher output in extractive industries will invariably have a greater skilled workforce too.

There are currently various projects currently in place that are based on bilateral agreements and are mutually beneficial to either state.

The rationale of examining the mineral clusters and RDC relevant to South Africa and Mozambique, is not only to illustrate that studies have been done and the concepts are accepted internationally, but most importantly that it is possible to focus on bilateral projects and beneficiation by sharing a value chain. This value chain does not have to be hindered by the states' borders.

The conclusive chapter will address the primary question of this study, namely, whether beneficiation can address the risks of the ARC to the emergent shale gas sectors of South Africa and Mozambique, the secondary research questions will additionally be addressed followed by remarks arising from this study.

CHAPTER 5:

FINAL CONCLUSION AND REMARKS

The extractive industry inherently elicits an emotional response from people in general. This response can be rooted in an individual's opinion about the interests of the environment or of a community, or it can even be rooted in anger and frustration aimed at the operators of an extractive project for expectations and promises not being upheld.

Arguably the most interesting response however, is that of hope. When a discovery is made of resource endowments, hope is invariably triggered. A host state has hope that the resource will bring growth and development to their state and its economy. An individual will have the hope of receiving better services, an improved standard of living, or even just employment. A prospective investor will have hope that investing in an extractive project will be a financial success.

The emergence of the shale gas sectors in South Africa and Mozambique, therefore, is hopeful. It is exciting that a sector that is new to each state can emerge into a meaningful sector that can make positive impacts to their economies. This hope is promoted by the extent of Mozambique's proven shale gas discovery.

The effects of the African Resource Curse are the risks associated therewith as illustrated in Chapter 3 hereof wherein a state can suffer stagnancy or a reduction in their economy despite having rich resource endowments. The risks associated with the prevalence of the ARC is a dagger to this concept of hope.

One can only sympathise as to how unfair, for lack of a better word, it must feel for a community member for example, to know that good money is being generated from the extractive project that is in his vicinity, but he does not feel the effects of the monies being generated. His country's economy does not seem to be improving, his community has not enjoyed better infrastructure or services and although he is not educated he hoped for a job at the new project, but he did not get it.

The man in the example was not skilled enough to work at the new shale gas project but due to a refinery or a logistics company operating by virtue of the shale gas project, he can attain employment and support his family.

This is essentially the idea and goal of beneficiation in light of this study. That a value chain is created by virtue of resources being extracted or exploited, and that value is added, at every possible juncture, to ensure that the effects of the ARC are felt by the state and its people. This value chain, however, does not need to be curtailed by the borders of South Africa and Mozambique.

From the outset of this study, this study has aimed to address both concepts of the ARC and beneficiation, as individual concepts and how the two may integrate with one another. Primarily this study has sought to ascertain whether implementation of beneficiation would be a feasible means to address the ARC and the risks associated therewith, in the emergent shale gas sectors of South Africa and Mozambique. The reasoning therefor being that the sectors are quite literally emergent, and as such South Africa and Mozambique have time to develop the foundations of their respective sectors in order to avoid the ARC and its resultant economic repercussions to a host state.

Clearly, a value chain is not established overnight and value-added beneficiation is not a given. From this paper it is evident that value added beneficiation implementation is complex, but there are guidelines to follow to attain beneficiation, namely:

- Linkages and the opportunities they present in the sector should be identified and explored;
- Governmental policies should support the sector and be viewed positively by investors;
- Host states should address the human capacity and education of its workforce and identify whether it can support the sector, and if it is found that it cannot, it should address education and skill building with short term and long-term goals in mind.
- Host states should assess whether its infrastructure can support the sector and enact a legal, institutional and regulatory framework that will attract FDI to develop infrastructure;
- Host states should develop clear industrial policy that supports a value chain and is conducive to being competitive in the international industry;
- Host states should not be lax and expect there to be automated growth and beneficiation simply due to their rich endowments. A host state should cultivate

this opportunity by providing for a legal, regulatory and institutional framework that incentivises investment and development in production activities while simultaneously addressing and suppressing corruption and resource rent seeking behaviour.

Ideally, a state would strive for a healthy individual sector, as well as supporting its own sector and value chain by through international trade when desirable. When assessing the relationship between South Africa and Mozambique, as well as their respective emergent shale gas sectors, a pattern emerges of an established trade and industry relationship with each state possessing an asset that the other does not possess. This relationship was demonstrated in chapter 4 hereof, as well as the supplementary established factors such as the states' mineral cluster and the existence of the Maputo Resource Development Corridor that supports this relationship and trading between the states. Further, with regards to bilateral beneficiation, this study has shown that contracts and projects in the oil and gas industry are already a reality. As such, bilateral beneficiation throughout the linkages of a shale gas sector value chain is not an obscure or unachievable goal to strive for and promote when the states consider their emergent shale gas sectors and the regulatory frameworks that are required to support their respective sectors.

Chapters 3 and 4 hereof illustrated the value of value retention and value retention, and addition, to and with an established value chain that operates alongside and ancillary to a sector. *In casu*, one would ideally promote a value chain that supports, that is not entirely dependent on a shale gas sector, but rather furthers value into different and diverse linkages and sectors.

Ultimately, can the effects of the ARC be addressed in the emergent shale gas sectors by means of beneficiation, and more specifically bilateral beneficiation? This paper shows that it is possible.

A value chain can be created that is not halted by the borders between the respective states. Each state has something to offer the other in respect of the linkages in the shale gas sector and ancillary midstream and downstream activities. Working together with the support of good and investment-incentive governance (enforced collectively and domestically) stakeholders can make value added beneficiation and bilateral beneficiation a reality. This reality will only be attainable through the implementation of regulatory frameworks that are FDI investment-friendly, facilitate beneficiation and facilitate the

implementation of successful value chains through the involvement of all the value chain's stakeholders, including the private sector, the community and the state. Good governance should aim to protect the economy and sustainable development thereof.

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FOOTNOTE ABBREVIATIONS

Afr. Inst.:	African Insight
Com W. Youth Dev.:	Commonwealth Youth and Development
Crt. Urb. Stud's:	Current Urban Studies
Euro J. Sust. Dev.:	European Journal of Sustainable Development
Int'l J. Recent Advances Multidiscip. Res.:	International Journal of Recent Advances in Multidisciplinary Research
New Agenda: S.A. J. Soc. & Econ. Pol.:	New Agenda: South African Journal of Social and Economic Policy
PELJ:	Potchefstroom Electronic Law Journal/ Potchefstroomse Elektroniese Regsblad
Sri Lanka J. Int'l L:	Sri Lanka Journal of International Law