URANIUM MINING 2000-2015: WHAT IMPACT ON THE NAMIBIAN ECONOMY?

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ABSTRACT: *The "Uranium Rush" in Namibia, is the direct result of good prices, increased environmental awareness and increased demand due to economic growth in countries such as China resulting in renewed exploration and investment in Uranium since 2000; with new mines joining Rossing Uranium. The paper looked at uranium mining in Namibia, the regulatory framework under which uranium mining takes place, and the impact of this venture on the Namibian economy by looking at its contribution to GDP and revenue generation. The paper found that uranium mining has a positive impact on the Namibian economy and also highlights the fact that there is need for a full impact analysis of uranium mining in Namibia with a focus on the environment and the socio-economics.*

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
MME	Ministry of Mines and Energy
NAMPOWER	Namibian Power Company
NAMWATER	Namibian Water Company
NDPIII	National Development Plan Three
NPC	National Planning Commission
TMC	Transnational Mining Company
V2030	Vision Twenty Thirty

1. INTRODUCTION

Since 1976, Rossing Uranium was the only operational uranium mine in Namibia but in 2007, it was joined by Langer Heinrich. Today, these two mines plus the Trekopje Mine (in pilot phase) make up the Namibian Uranium mining footprint. Three other mines; Valencia, Rossing South and Etango are expected to become fully operational in the next five years.[1] During the period 2000-2008, the Namibian economy received more than 50 % of their export earnings from mining, an average of 11% of its GDP in the period 2000-2009 was derived from mining,[2] the aforementioned significant increase in mining activities represents an increase in export earnings. Thus the question - what will be the impact on the Namibian economy from these expected investments? Analysis of the administrative and regulatory environment, the Namibian uranium mining growth, the impact so far and the expected impacts on the economy shall provide insight required to answer the aforementioned question.

It has been argued by economists such as Sachs and Warner[3] over the years that increased incomes from mining booms in mineral rich countries do not automatically equate with a positive impact on such a country's economy. Similarly it has been argued that mining booms jump starts industrialisation in countries, thus economic growth as evidenced in countries such as Chile.[4]

Indications are that the Namibian economy is expecting to reap huge benefits from what is being labelled the Uranium Rush[5] in the Erongo Region (Uranium Province), a welcome prospect in light of the global economic recession in 2008. The Uranium Rush is a significant, if not the most significant, large scale investment in Namibia since the recession due to the expected impact on the economy. Uranium mining is expected to surpass the

[1] Uranium Institute Annual Report http://www.chamberofmines.org.na/main/safety-sustainable-development/namibia-uranium-stewardship/uranium-exploration-mining-in-namibia.html (last visited 21 January 2012)
[2] Mining Journal, Namibia Uranium Focus. http://www.mining-journal.com/__data/assets/supplement_file_attachment/0003/207642/Namibia_scr.pdf (last visited 21 January 2012)
[3] Sachs, J.D., and Warner. A.M., *The Curse of Natural Resources* European Economic Review 45(-6) 2001: 827-38
[4] The International Study Group Report on Africa's Mineral Regimes, Minerals and Africa's Development http://www.eisourcebook.org/cms/files/attachments/other/Minerals%20and%20Africas%20Development.pdf (last visited 12 January 2012)
[5] Ministry of Mines and Energy, Strategic Environmental Assessment for the Central Namib Uranium Rush, Windhoek, Namibia. Government of the Republic of Namibia Printers 2011.

diamond sector as the largest foreign currency earner in the mining industry between 2015 and 2020.[6] As a country with a very high income disparity having a Gini-coefficient[7] of 0.5 and a high level of poverty with more than 50% of people under the poverty line[8] and unemployment at 52%,[9] it is necessary that any impact on the economy should be studied and proper plans be developed based on these studies and discussions. This paper will allow for reaching a conclusion based on the issues discussed and consequently make possible suggestions and recommendations relating to issues raised such as the economic contribution to the Namibian economy as well as the resultant impacts.

2. URANIUM MINING; NAMIBIA

2.1. Namibian Uranium Mining

Mining for uranium started in 1976 when Rossing Uranium commissioned the first uranium mine in the Erongo region which only reached full production in 1979 due to some teething problems.[10] Uranium mining in Namibia is carried out in open pits as this is arguably more cost effective than underground mining. This process is necessitated by the low grade ore and the fact that Namibia's uranium is located on, or close to the surface. Due to the jump in oil prices during the 1970s, uranium exploration worldwide experienced a surge, mainly because of the rise in interest in nuclear power together with fears that the existing uranium resources would not be enough to sustain the expected growth in demand for nuclear power.[11]

Exploration in Namibia was no exception. International mining companies such as Falconbridge and Elf-Aquitaine as well as South African companies such as Anglo American, General Mining and Gold Fields were searching for uranium to support their outputs from the gold mines. This was to provide for the South African government's nuclear weapon programme in the 1970s.[12] This exploration was not followed by the expected developments of mines, mainly as a result of the drop in oil prices and consequently the uranium prices, and only Rossing Uranium continued to operate.

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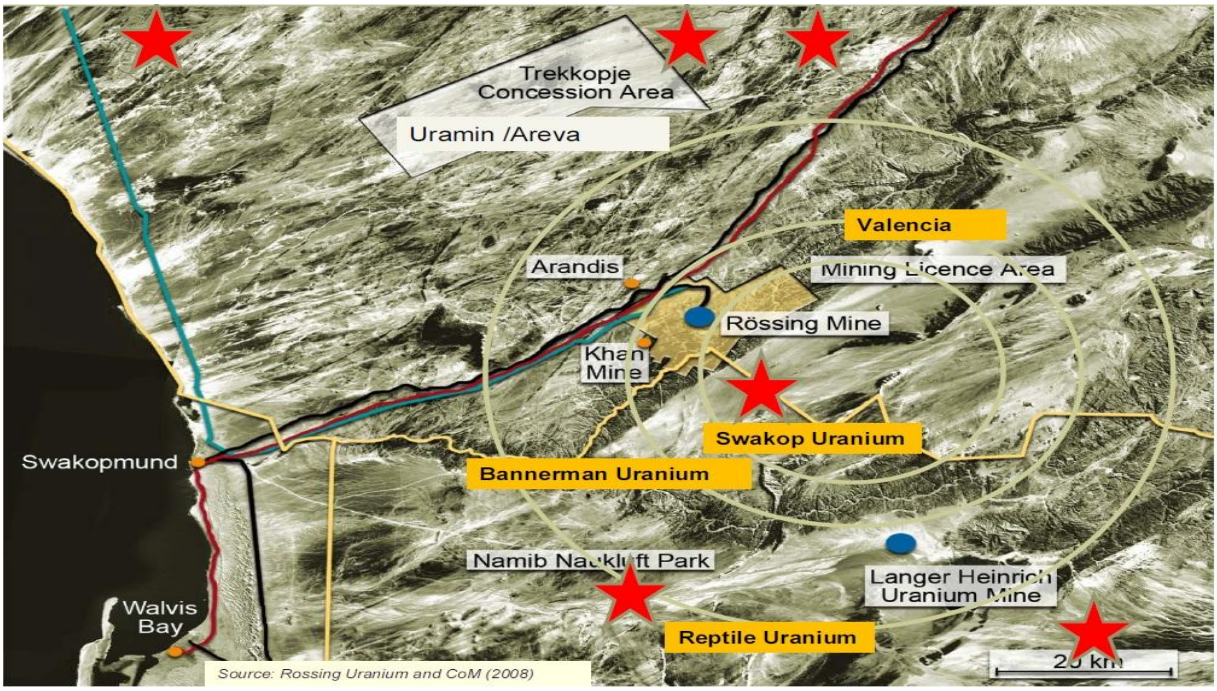
[6] Frost and Sullivan *Updated Overview of the Namibian Electricity Industry* 2010 http://fso.frost.com/prod/servlet/frost-home.pag (last accessed 03 January 2012)
[7] This is a term used for measuring the income disparity of a country
[8] National Planning Commission, National Development Plan III (Windhoek, Namibia Government of Namibia Printers 2006)
[9] Bank of Namibia,Quarterly Bulletin2011 https://www.bon.com.na/Publications/Quarterly-Bulletins.aspx (last accessed 05 January 2012)
[10] *Supra* note 5 page 4-4
[11] Crowson, P. Mining Unearthed (London, UK: Aspermont 2008).
[12] *Supra* note 5 page 4-4

Whilst uranium prices remained at a relatively low level, little interest was expressed in uranium mining in Namibia during the 1980-90s. This however changed in the new millennia with sustainability, rising cost of fossil fuels and the increased demand for renewable energy leading to the prominence of uranium; which is sometimes referred to as the "nuclear renaissance".[13] The renewed interest in nuclear energy was accompanied by improved spot prices with a spike at $137/lb U3O8 in 2007[14] after which it levelled out and is expected to improve markedly with the decrease in secondary uranium supply from Russia, where the ceasing of their nuclear programme have resulted in processed (secondary) uranium being available for power generation.[15] In Namibia, the resultant effect of the nuclear renaissance has been the Uranium Rush with approximately 40 EPLs and 12 licenses being issued.[16] Namibia through the Rossing mine currently produces around 8% of the world's uranium[17] and with the increased mining activities is set to become one of the top 2 producers in the world.[18]

The uranium province in the Erongo region and the different mining sites are illustrated in Diagram 1 - a representation of the area courtesy of Rossing Uranium (2008).[19]

[13]World Nuclear Association. *The Nuclear Renaissance 2011* http://world-nuclear.org/info/inf104.html (last visited 09 January 2012)
[14] *Supra* note 2
[15] Pool T.C, *Primary and Secondary Uranium Supplies:*
Different Cost Structures, Different Goals. http://www.world-nuclear.org/sym/1997/pool.htm (last visited 26 January 2012)
[16] Shindondola-Mote, H. *Uranium Mining in Namibia 2009* http://somo.nl/publications-en/Publication_3061 (last visited 21 January 2012)
[17] Forsys Metals. *Corporate Presentation* 2011. http://forsysmetals.com/wp-content/uploads/2011/09/Forsys-Corporate-Presentation-September-11-Presentation_final.pdf (last visited 15 January 2012)
[18] http://www.miningmx.com/page/news/energy/263842-Namibia-rises-in-world-uranium-ranks#.UPlxUKAdxk0 (last visited 16 January 2012)
[19] Uranium Mining Area – Erongo Region http://www.rossing.com/ (last visited 20 January 2012)

Diagram 1 Uranium Mining Area (Uranium Province)



2.2. Administrative Framework (Legal Framework)

The uranium industry in Namibia has always only been part of the general mining industry with no special attention being paid to it, as is the case with diamonds. As such, uranium has been managed under the same Acts, Policies and Regulations as other minerals. In addition to the prevailing Namibian Laws, the Namibian constitution in Article 144 states "Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international law and international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia." and this ensures that the production and disposal of Uranium is carried out according to prescriptions of the International Atomic Energy Agency (IAEA).

The acts, regulations and policies[20] under the Namibian constitution that guide uranium mining in Namibia are;

- Minerals (Prospecting and Mining) Act, 1992 (Act 33 of 1992)
- Atomic Energy and Radiation Protection Act no 5 of 2005
- Foreign Investments Act, 1990 (Act 27 of 1990)

[20] Legal Assistance Centre, Namibian Laws http://www.lac.org.na/laws/namlex.html last visited 22 January 2012

- Environmental Management Act no7 of 2007
- Water Act, 54 of 1956
- Financial Intelligence Act 3 of 2007
- Minerals Development Fund of Namibia Act 19 of 1996
- State Finance Act 31 of 1991
- Income Tax Amendment Act, 2010 (Act No. 5 of 2010)
- Labour Act 11 of 2007
- SADC Protocol on Mining, 1997
- Water Resources Management Act, 24 of 2004
- Minerals Policy of Namibia, 2002
- Environmental Impact Assessment Policy(1995)

The administrative framework for the extraction of uranium is provided by all of the legal instruments involved. What is evident is that there has not been a specific act or policy that deals with uranium on its own as a special mineral. In 2007, Government suspended issuing of new EPLs in order to deal with the uranium rush and finalise the processing of mining licenses.[21] A Cabinet decision in 2007 demarcated uranium as a strategic mineral, and also as a potential energy production source, with the opportunity to maximise its own natural resources.[22] This decision, together with the uranium rush, has resulted in the drafting of a dedicated policy on the entire Nuclear Energy Fuel Cycle. It is expected that this policy shall complement the abovementioned legislation in an effort to ensure proper management of exploration extraction and development of uranium. At the same time, it is intended to provide a conducive and competitive environment to optimise mutual benefits for the country and investors.

2.3. Fiscal Regime

The Fiscal Regime is provided by the State Finance Act, Income Tax Act, Mineral Development Fund Act and The Foreign Investment Act and these provide for the operations of mines in Namibia. These Acts ensure that government regulates the mining sector and the private sector leads the operation of the mining sector. In doing so, the government earns economic rent through taxation and royalties by determining the optimum rent payable for

[21] Wise – Uranium. *Namibian Moratorium on Uranium Exploration 2007* http://www.wise-uranium.org/uregafr.html (last visited 21 January 2012)
[22] Nuclear Fuel Cycle Policy (Draft), Namibia, Ministry Of Mines And Energy, 2011

the extraction of the natural resources. In Namibia, all mineral resources are owned by the state and as such justify the demand for rent for the extraction of such resources.

Since 2007, uranium mines have a fixed royalty rate of 3%. This rate is adjustable based on applications by the mines in extreme circumstances such as the 2008 recession. [23] The corporate tax rate is 37.5% on profits derived from uranium mining and non- mining profits are taxed at 40%.[24] It should be noted that Rossing Uranium paid a rate of 6% according to an agreement with government.[25] All taxes and royalties are paid to the Namibian Treasury, from which all government expenditure is appropriated according to government priorities. These government priorities are in accordance with Namibia's Vision 2030[26] which is the long term development policy that aims at making the country an industrialised country and that is implemented through a series of 5 year development plans.

The freedom to invest and transfer capital and dividends by foreign companies is provided for by the Foreign Investment Act and no minimum local equity ownership/shareholding in mining companies is currently stipulated by legislation. This creates a fiscal environment that businesses are looking for in order to invest, and enables the government to utilise rent for the improvement of public sector programmes aimed at sustaining economic development.

3. URANIUM MINING AND THE ECONOMY

3.1. Overview of the Namibian Economy

The Namibian economy used to be a natural resource based economy focussing on agriculture and the extractive industries as the main contributors to GDP rather than a more diversified economy.[27] Despite this, the socio economic picture of Namibia is not very rosy given the high poverty and inequality levels. A third of the population live on USD 1 or less per day. The Gini coefficient was around 0.7 in 2010 resulting in Namibia being one of the most unequal economies in the world. Most of the population still depends on subsistence agriculture for their livelihood. Focussing on a mixed-market economy model, and ensuring that government functions to largely facilitate private sector development through the

[23] *Namibian Royalty Rate now 3%* Mining Journal. http://www.mining-journal.com/exploration--and--development/namibia-uranium-royalty-rate-now-3 (last visited 15 January 2012)
[24] *Supra* note 1 page 107
[25] Swiegers, W., and Munro, B., *Namibian Uranium; A Blessing or a Curse 2011* http://namibiauraniuminstitute.com/joomla/pdf/2012/blessing-or-a-curse.pdf (last visited 19 January 2012)
[26] National Planning Commission (NPC), Vision 2030, NPC, Windhoek (2004).
[27] Millennium Challenge Account, Namibia Programme http://www.mcanamibia.org/files/files/mca_full.pdf (last visited 22 January 2012)

provision of regulatory framework and investment opportunities seems to be transforming the Namibian economy[28] as clearly stated in V2030 and the national development plans as well as policies guiding investment, development and fiscal frameworks. The processing of natural resources and other value added activities forms part of these strategies by government. This is resulting in increased contribution of the services sector, tourism, financial service sectors and high value irrigation products such as grapes and dates to the Namibian GDP.

In 2010, following a 0.7% contraction in 2009, the Namibian economy grew by 4.2%. This was due to credit extension but was also primarily related to the recovery in diamond and uranium mining activities. The sustained improvement in global demand for mineral products is expected to maintain gross domestic product (GDP) growth in 2011 with a slight rise to 4.8%, and then a minor drop to 4.6% in 2012. Outputs in mining recovered as global demand improved, while agricultural outputs recovered due to good weather conditions. Namibian manufacturing has not only remained resilient amid the global downturn but also expanded in 2010.[29]

Namibia implemented strong monetary and fiscal policies to protect the country's economy from the recession of 2008 onwards. These fiscal measures and a lowered income from the Southern African Customs Union (SACU) may lead to negative effects on the government deficit. The medium term aim of government is to ensure a balance between fostering growth and fiscal sustainability to ensure continued progress in stabilising the economy.[30]

3.2. Uranium Mining & the Namibian Economy

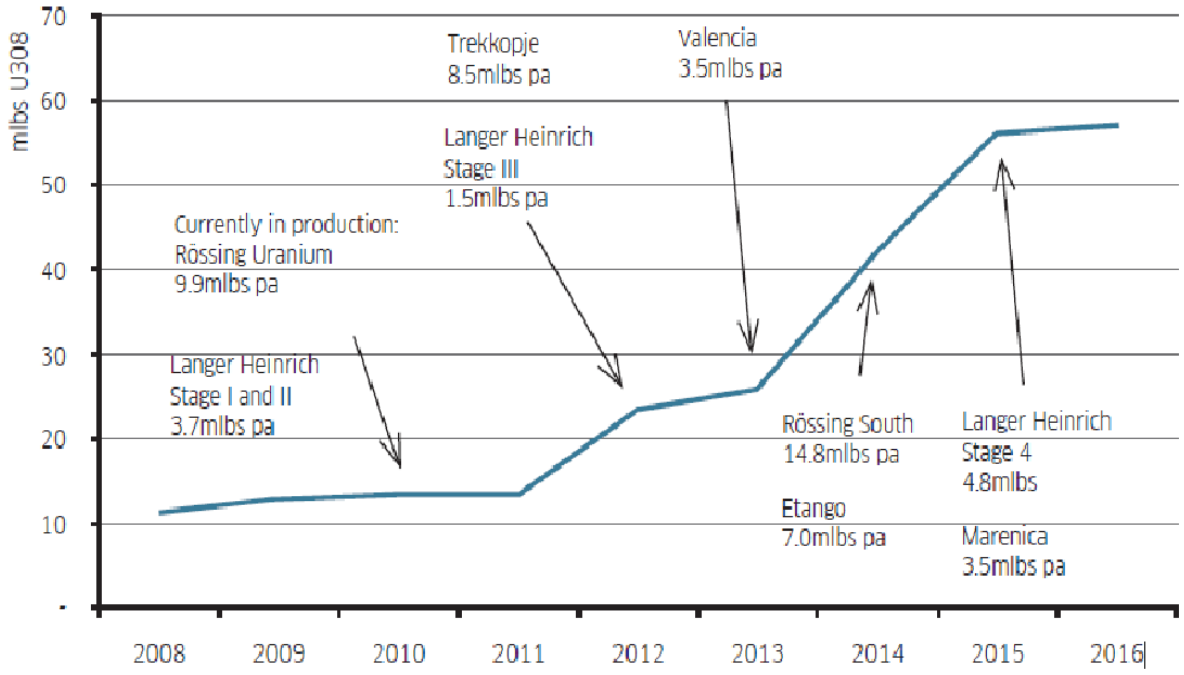
Namibia is currently the fourth largest producer of uranium in the world and the biggest exporter of uranium in Africa. Increased uranium prices as a result of increased demand from countries such as China and India is expected to anchor the Uranium Rush and the expected economic growth in the future. With this increased demand in uranium and expected decrease in the production of diamonds, uranium is poised to overtake diamonds as the main mineral

[28] Bank of Namibia Annual Report 2011 found at https://www.bon.com.na/CMSTemplates/Bon/Files/bon.com.na/3d/3da3882d-6fe7-43dc-9649-9ffffb7fc671.pdf (last visited 24 January 2012)
[29] *Supra* note 27
[30] Ministry of Finance. *Medium Term Expenditure Framework 2011* http://www.mof.gov.na/Budget%20Documents/budget%202010/201011%20MTEF.pdf (last visited 13 January 2012)

export commodity although diamonds are still expected to contribute approximately 15% of Namibia's foreign exchange earnings.[31]

The expected production increases presented in Figure 2 illustrate the significant increases in returns to the Namibian economy and government revenue in the future, providing a snap shot of the expected production figures for the different mines as they are expected to reach full production.

Figure 1 Namibia's Uranium Production Profile[32]



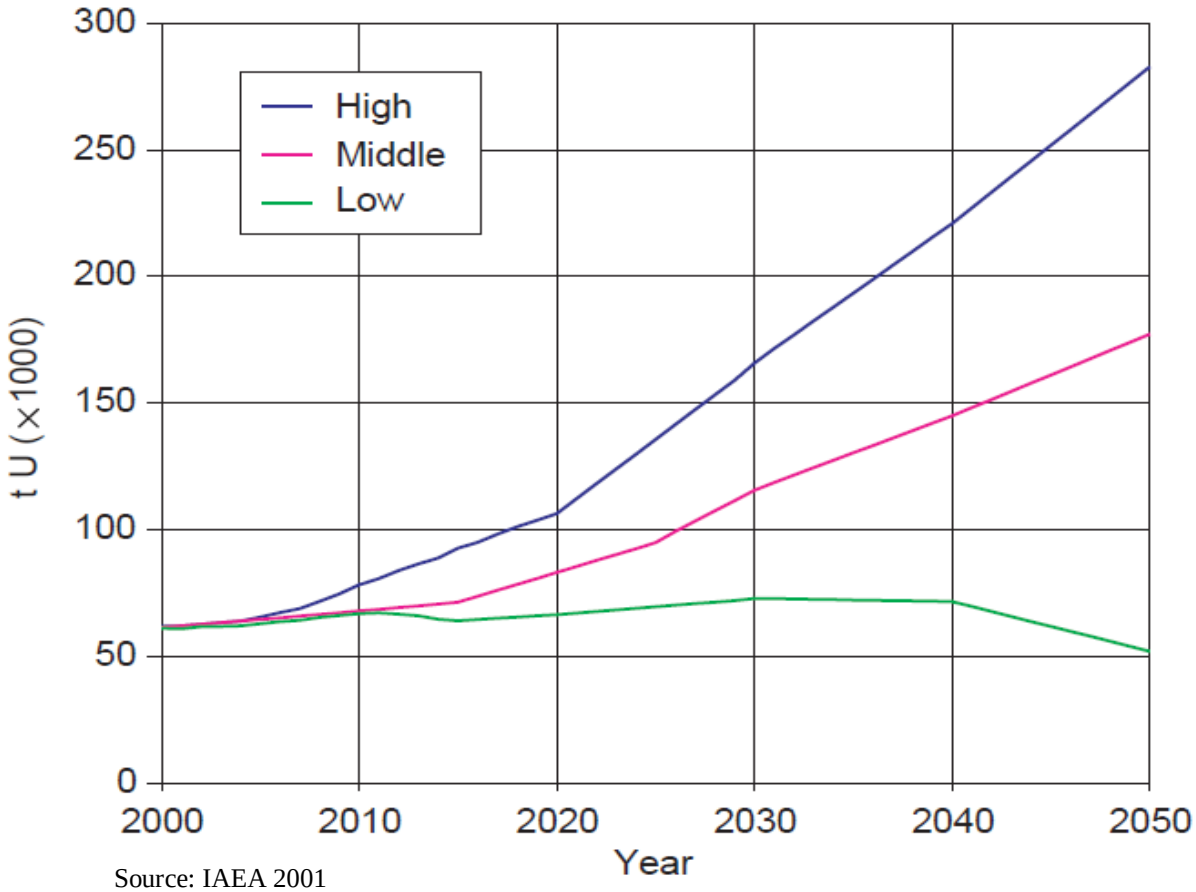
Source: Simonis Storms Securities Research 2008

In its quarterly review, the Bank of Namibia reports that uranium mines could not reach their production targets in 2011 due to various reasons that included high rainfall, low uranium prices and industrial actions.[33] Due to the Japanese Fukushima Nuclear Power Plant disaster, a number of countries reviewed their nuclear programs but ultimately most of the countries are continuing their nuclear programs due to energy security issues, thereby again strengthening the growth projections of uranium. The demand for uranium is driven by fossil fuel depletion and increased initiatives for renewable energy. The IAEA estimates that the

[31] *Supra* note 6
[32] Chamber of Mines. *Uranium Industry2011.*
http://www.chamberofmines.org.na/uploads/media/Uranium_Industry.pdf (last visited 19 January 2012)
[33] Bank of Namibia 2011 Quarterly Bulletin
https://www.bon.com.na/docs/pub/Economic%20Outlook%20Dec%202012.pdf (last visited 22 January 2012)

demand for uranium will continuously increase over the next 40 years as is depicted in Figure 3 below in low to high demand scenarios.[34]

Figure 2 Projections of Annual Uranium Requirements 2000-2050



Source: IAEA 2001

Uranium mining is set to continue its growth and in doing so will become a major contributor to the country's GDP. With expected revenue increases, economic growth is expected to follow.

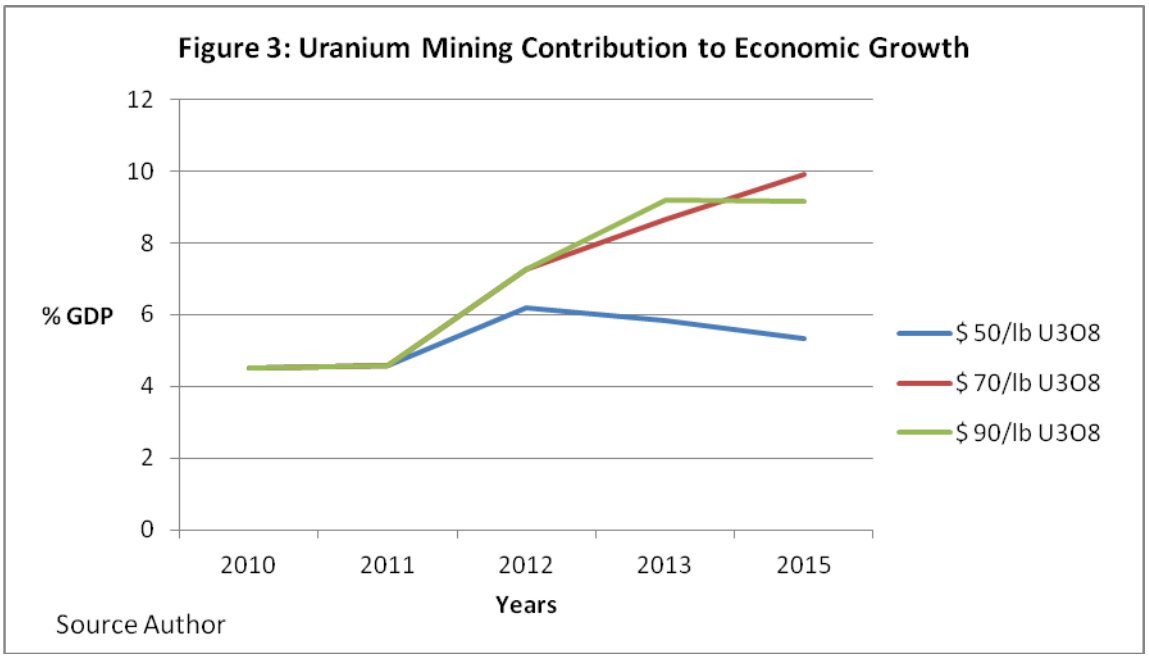
3.3. Analysis of the Economic Impact

Uranium mining's contribution to GDP is expected to increase from 5% in 2009 to 15% in 2015 mainly due to increased production. As more mines come on line, the revenues pouring into government coffers will see a rise from N$ 1.2bn in 2009, to N$2.6bn by 2015.[35] These inflows will add to the increased implementation of government's Vision 2030 towards a

[34] *Analysis of Uranium Supply to 2050* IAEA 2001, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1104_scr.pdf (last visited 26 January 2012)
[35] *Supra* note 20

diversified economy. Through the application of a GDP multiplier of 1.98[36] the impact would further add to the country's economic growth. The SEA data indicate that uranium contributions to GDP will continue to increase at prices higher than $50/lbU3O8 if GDP for the country grows at the current rate. In Figure 3, projection of contributions to GDP is done using a three price scenario assuming that a fixed 5.1% GDP growth rate for Namibia.

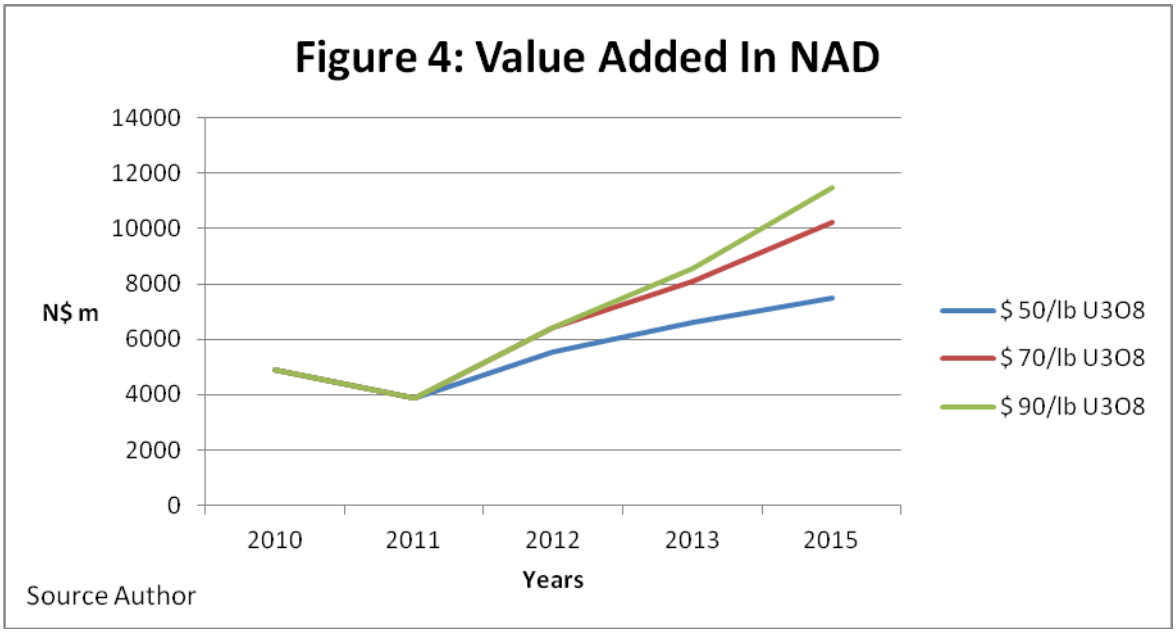
Figure 3 Uranium Mining Contribution to Economic Growth



The contribution of uranium to GDP continues to increase at all three price levels with an observed decrease from 2012 at the $50 price scenario, but the growth rate remains well above the 4% currently in evidence. In Figure 4, the same scenarios with the same prices are plotted but for the value addition in Namibian dollars in order to see how the national economy will benefit directly. The analysis indicates that revenue to government would still increase. A marked difference is apparent at all three price level scenarios. It can thus be concluded that the economy at large can be expected to grow accordingly due to the multiplier effect of investment in uranium mining.

[36] *Supra* note 5 page 103

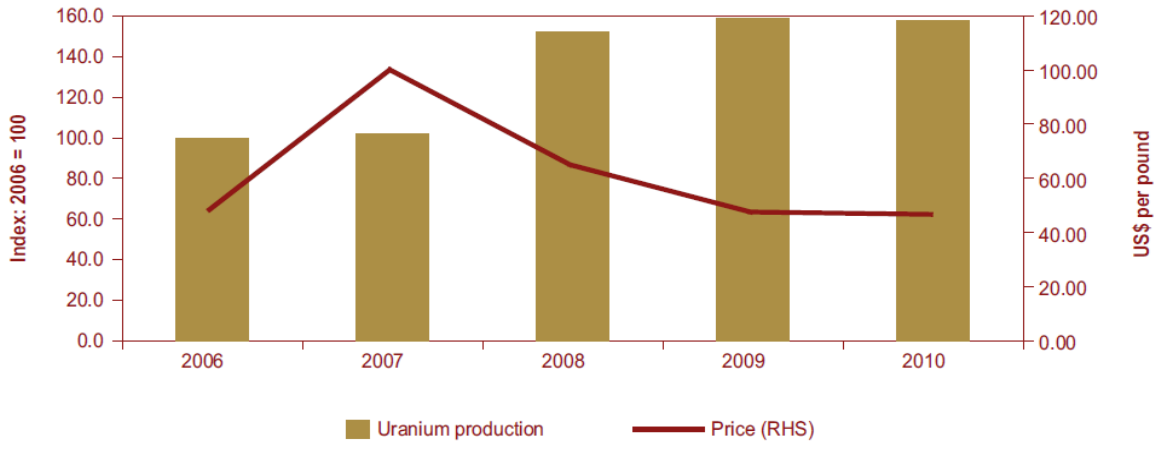
Figure 4 Value Added in Namibian Dollars (NAD)



The Bank of Namibia in its 2011 annual report confirms the expected growth outlook and adds that China's increased demand will further add to the uranium growth.

The report points out that despite uranium price decreases as illustrated in Figure 5, production of uranium continues to increase, with new mines opening over the next few years and demand still increasing. Projections by the IAEA indicate a growth of the Namibian economy.

Figure 5 Namibian Uranium Production[37]



Sources: Langer Heinrich, Rossing and IMF

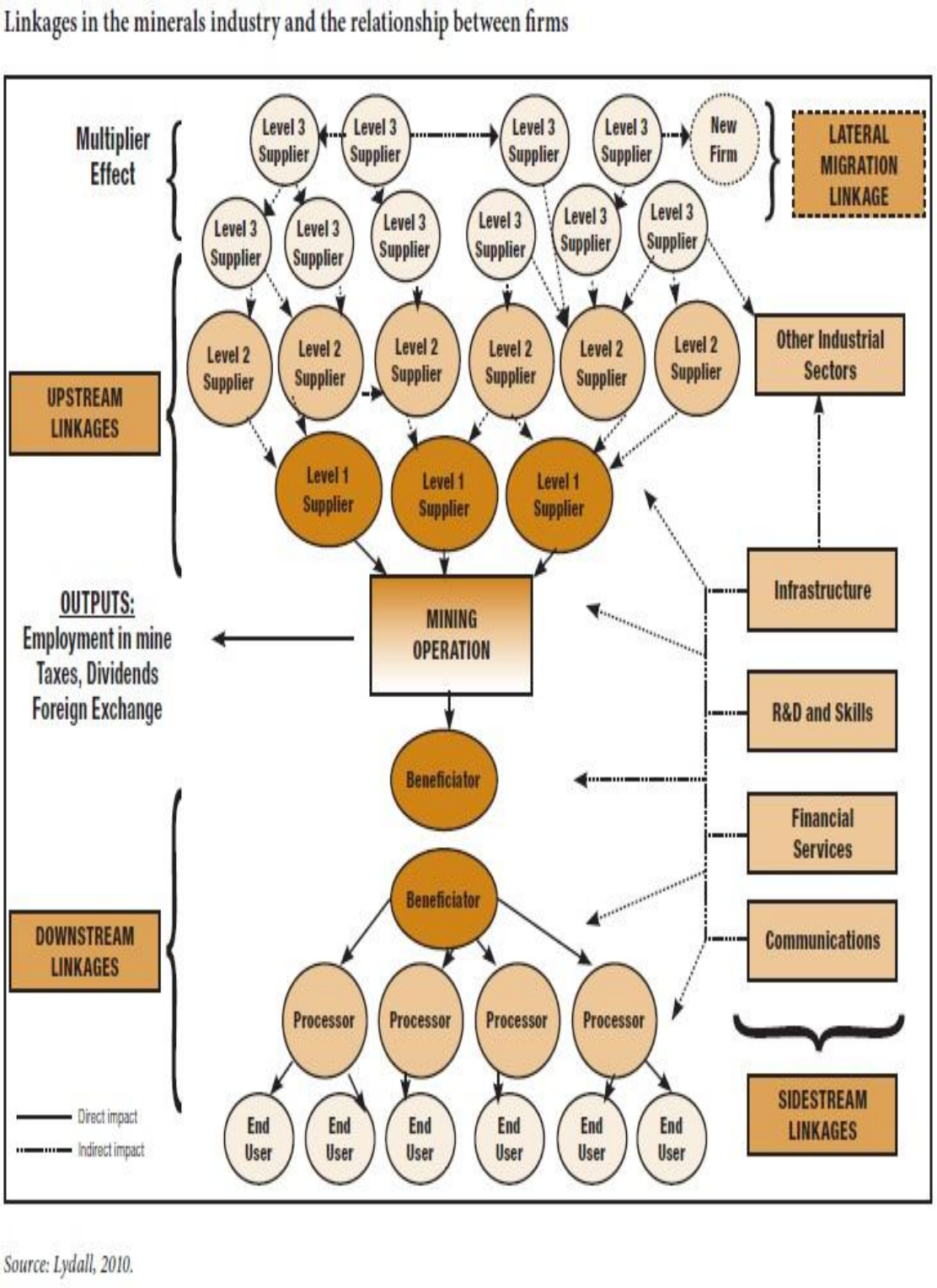
[37] *Supra* note 32

Other impacts due to the Uranium Rush would be improved infrastructure in the Erongo region with bulk utility provision being crucial to mining already in the process of implementing large infrastructure investments. Nampower is planning the construction of a Coal burning electricity generation plant in order to address current and future demand.[38] NAMWATER[39] is planning to set up a desalination plant at Mile 6 to supply the mines as well as the central coastal region with water. These two major projects are a direct result of the Uranium Rush and address shortages of water and electricity infrastructure in the country that were not viable to develop before the advent of the rush.

Investments of such a large scale on the required infrastructure is already on-going and the expected growth in the uranium sector has impacted on the whole country and the different sectors such as transportation, infrastructure, manufacturing, housing and services, both directly and indirectly. Diagram 2 provides a multiplier matrix that illustrates the complex linkages between mines, service providers, the community and the government. It serves as a visual maze of the impacts from mining investments and what can be expected from the Uranium Rush.

[38] *Supra* note 6
[39] *NAMWATER desalination project at Mile 6*. http://www.namwater.com.na/data/Projects_Desalination.htm (last visited 26 January 2012)

Diagram 2 Minerals Industry Multiplier Matrix



Source: Lydall, 2010.

Institutional areas where further impacts due to the Uranium Rush are to be expected include roads, telecommunications, the local authorities and banks. The increase of migration due to opportunities in the mining and service provision sectors is expected due to increased numbers of employees directly employed by the uranium sector that will increase from the

current figure of 1,700 to approximately 4,500 employees by 2015 based on the growth scenarios at $70/lb U3O8. This analysis looked primarily at the economic impact represented by GDP, but as illustrated by the multiplier matrix, the impacts are complex and difficult to monetise. Other impacts are presented in tabular format in Table 1[40] with a classification indicating whether it is a positive or negative impact or both. This is indicative only, as the scope of the study does not allow for such an in-depth analysis of all impacts of the uranium rush.

Table 1 Impacts of Uranium Rush

Impacts Elements	Comments on Elements	Positive	Negative
Ecological sensitivities of Namib environment (endemic species, integrity of ecological communities), landscape	The increase in humans as well as mechanical implements can lead to destruction of environment if not properly managed.(with Uranium Rush it is attempted to minimise this impact)	X	X
Mine closure, rehabilitation and post-mining land uses	Mine closure impacts on society and the environment even if managed		X
Social infrastructure (health facilities, recreation facilities, schools), development	With increased migrants these services are taxed to the hilt, normally a boom results in improvement of these services	X	X
Reduce unemployment	Increased employment normally leads to reduction of social ills.	X	
Economic development-support for Local Authorities	Opportunity for LA to attract investment and to create diversified economy	X	
Social structures	Due to influx of immigrants the social construct of local cultures are altered and sometimes destroyed		X
Opportunities for synergistic businesses such as labs, security, engineering, housing development, medical facilities etc.	Economy of Scale provide opportunity for growth in these areas	X	
Availability of skills	Normally limited in the beginning but with training this improves	X	
Health	The health risks of uranium exposure is limited, but will increase with more development in the sector		X
Development of rail and harbour facilities	Mining and service industries provide for the economies of scale to boost development in these areas.	X	

Source: D O C Hammerslacht 2012 (author)

[40] The information contained in this table represents views of the author developed through the information digested from all referenced sources.

4. CONCLUSION

The study of the impact of uranium mining on the Namibian economy was limited by contribution to GDP due to the magnitude of the expected impact. It is not limited to the extractive sector only, but has spread to areas such as housing, health, environment, roads and telecommunications. The study provides a background insight into uranium mining, the legislation by which the sector is governed, and an overview of the relationship between the sector and the Namibian economy. The Namibian government utilises its natural resources in a manner that is sustainable and protectionist, but was caught unprepared by the Uranium Rush to the extent that a moratorium on EPL needed to be issued to better plan, coordinate and manage the sector. The growth is set to continue with capital investment already made both by government and the private sector and herein lays the magnitude of studying the impact on the economy.

The study looked at the contribution and the expected contribution to GDP to determine the impact on the economy and future impacts. It has been determined through analysis and assumptions that indeed the uranium mining has positively contributed to the Namibian economy and is set to continue to do so. Due to the interconnected nature of inputs and outputs in the industry it is recommended that an in-depth study of environmental and socio-economic impacts is carried out with more analysis and different tools being applied to provide a fully quantified picture of the impact of uranium mining in Namibia.

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