Uranium mining in Namibia

The mystery behind 'low level radiation'

[Picture of Rossing open pit here]

. . . 'There is no such thing as a safe dose of radiation. It is known that radiation kills, maims, causes mutations, is cumulative, causes leukemia, cancer, respiratory illnesses and attacks the immune system' (Bertell, 1994).

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October 2008

Abbreviations

AIDS-*Acquired Immune Deficiency Syndrome*

BON-*Bank of Namibia*

CAF-*Canadian Ambassador's Fund*

COM-Chamber *of Mines*

CBNRM-*Community Based Natural Resource Management*

GDP-*Gross Domestic Product*

HIES-*Household Income and Expenditure Survey*

HIV-*Human Immune Virus*

EPL-*Exclusive Prospecting License*

EIA-*Environmental Impact Assessment*

EMA-*Environmental Management Act*

EWT-*Endangered Wildlife Trust*

EMP-*Environmental Management Plan*

MET-*The Ministry of Environment and Tourism*

MME-*Ministry of Mines and Energy*

MUN-*Mine Workers Union of Namibia*

NIMT-*Namibian Institute of Mining and Technology*

NAMDEB-*Namibia Diamonds Co-operation Limited*

NGOs-*Non-governmental Organisations*

NLFS-*Namibia Labour Force Survey*

LaRRI-*Labour Resource and Research Institute*

LIFE-*Living in a Finite Environment*

SADC-*Southern African Development Community*

SOMO-*Centre for Research on Multinational Co-operations*

USAID-*United States Agency for International Development*

Acknowledgements

This project was commissioned and funded by the Centre for Research on Multinational Corporations (SOMO) in the Netherlands. The author is grateful to Joseph Wilde, who was responsible for coordinating the funding for this project. Much of the content and knowledge of the report is drawn from the writings of Bertchen Kohrs of Earthlife Namibia. We are therefore highly indebted to Bertchen. My appreciation goes to Naita Kamho of LaRRI, for not only assisting with data collection, but also transcribing the bulk of the interviews. Appreciation should also be extended to Lo-Rain Shiimi for assisting with the transcription of interviews, while Herbert Jauch assisted with editing the report.

We are thankful to the officials of the Ministry of Mines and Energy, especially Mr. Shivolo and Ms. Helena Itamba, as well as Mr. Teofilus Ngitila of the Ministry of Environment and Tourism for providing insights on the laws and procedures guiding mining activities in Namibia. Our access to Rossing Uranium mine was facilitated by Mr. Alwyn Lubbe, who gave us a guided tour of the mine. Our appreciation should also be extended to Mr. Jerome Mutumba of Rossing for his contributions. We appreciate the discussion with Dr. Wouten Swieggers of the Chamber of Mines, Swakopmund office. We also highly appreciate Mr. David Amupolo of Rossing for assisting us during our field work.

Many thanks are extended to the current and former Rossing workers who were interviewed for this study. We thank them very much for sacrificing their precious time and telling us about their work and life experiences. We sincerely hope that their testimonies will lead to some action regarding the promotion and protection of the rights of mine workers. Through these findings, we trust that our policy makers, mining companies, community organizations, community leaders, and trade unions, will find common ground on how to tackle the difficulties facing mine workers.

Table of content

1. Introduction

This report is the result of a project on uranium mining in Namibia commissioned by the Centre for Research on Multi-national Corporations (SOMO). The findings are based on secondary literature drawn mainly from the writings of Earthlife Namibia and empirical data collected by LaRRI during July and August 2007. Much of the issues raised in the report are meant to trigger debate on uranium mining and its social, economic and environmental repercussions.

This report is coming at a time when the price of uranium has increased substantially. Consequently, this is also the time when many investors are looking at Namibia as a potential uranium supplier. The report should therefore be of interest to all parties interested in uranium mining, both locally, regionally and internationally. Suggestions put forward in this report are meant to steer the future direction of uranium mining in Namibia. We hope that this document will contribute to a better understanding of uranium mining in Namibia and stimulate some action regarding the protection of the health of workers, their families and their surroundings.

We are hope that the report can be used as an advocacy tool. The findings of this report can contribute to behavioural changes of uranium companies currently in existence and those who want to invest in future. We hope that the report will appeal to a number of stakeholders, including government, mining companies, the chamber of mines, trade unions, researchers, academics, investors and civil society. The report should therefore be seen as an information resource beneficial to a number of stakeholders.

1.1. Background and purpose of the study

Uranium production is making a come-back after decades of decline following Chernobyl disaster of 1986. Due to rapid climate change and pollution created by coal, accompanied by high oil prices, uranium prices have moved from less than U$10 per pound to a current high of about U$92 per pound. During the first half of 2007, the uranium spot price climbed from U$72.00/lb U_3O_8 to an unprecedented peak of U$136.00/lb in June. It then declined to a low of U$75.00/lb in October to recover towards the end of the year to U$90.00/lb. By September 2008, the spot prices leveled at U$ 82. 00 (Weidlich, 2008).

In spite of the tight uranium market, world uranium production decreased by 5% to 39,655 tons of uranium in 2006, due to various problems at existing mines and because of the long time-spans required for the development of new mines. Production continued to be lower than the actual demand, but the balance was

made up through various stockholdings. Worldwide, the number of uranium mining and exploration companies increased by 65% from 570 to 940 during 2007.

Uranium mining in Namibia started in the late 1970s; however only one mine has been operational for more than 30 years. The second uranium mine started operating at the beginning of 2007. In recent years however, the Ministry of Mines and Energy issued more than 40 Exclusive Prospecting Licences (EPLs) for exploration and prospective licences to (potential) investors. Twelve (12) more mining licences were already issued (Weidlich, 2007). It is therefore clear that many uranium mines will be operating in Namibia in the years to come.

[Here: Map of Namibia indicating the spread of uranium exploration sites]

For these reasons, this study aimed to identify where and under what conditions uranium is being mined in Namibia. The specific objectives included:

- identifying the licensing of potential uranium sites and explorations taking place in the country
- understanding the country's mining laws and general legal framework informing uranium mining in Namibia
- Collecting information on the destination of Namibia's uranium

We also sought to determine the type of contracts between government and the companies. This included exploring the environmental, labour and human rights conditions of the site, workers and surrounding communities, understanding the general safety conditions at the uranium mines and finally, raising awareness of the impact and dangers associated with uranium mining-more particularly on the links between uranium mining, the nuclear industry and nuclear weapons as well as highlighting the importance of alternative energy sources as well as educating stakeholders on clean, safe, and sustainable development.

1.2. Research design

Our data collection consisted of a combination of secondary and primary data. Much of the secondary material was obtained from the Ministry of Mines and Energy, Earthlife Namibia publications as well as publications of Rossing Uranium. The primary data was collected through face to face interviews with officials of the Ministry of Mines and Energy. These officials shared information regarding sites where uranium mining is taking place or where it is planned to take place, the number of licenses issued and how many applications were being received. We also asked questions regarding the demand for uranium exploration in Namibia as well as the legal framework informing these applications. In addition, we conducted interviews with the management of Rossing. We

conducted interviews with several current and former Rossing workers. We tried on more than two occasions to secure any appointment with any of the managers at Langerheinrich with no success. All interviews were treated as confidential.

2. Namibia: a brief profile

Namibia is a vast country inhabited by a population of less than 2 million. At 825.418km² (318.7 sq mi), Namibia is the world's thirty-fourth largest country after Venezuela. After Mongolia, Namibia is the least densely populated country in the world (2.5 inhabitants per square kilometre (6.5/sqmi). Most of the vegetation is semi-arid to arid with very low and unpredictable rain falls. Namibia gained independence from South Africa in 1990. Partly due to the two countries shared history, Namibia and South Africa's economies remain closely tied. Most of the imports in Namibia are of South African origin. Consequently, the Namibian economy remains firmly in the hands of South African capital-characterised by South African commercial banks such as First National Bank, Standard Bank and NedBank. Included are South African, clothing, furniture and retail food chain shops such as Shoprite, Edgars, Woolworths, Identity, Elleriness, Game amongst many others.

Blessed with an abundance of natural resources, Namibia is one of the wealthiest countries in Africa with a Gross Domestic Product estimated at $14.3 billion in 2005. Namibia is also classified as a lower middle-income country, based on the annual average per capita. Although per capita GDP is five times the per capita GDP of Africa's poorest countries, the majority of Namibia's people lives in rural areas and relies on subsistence farming for survival. As a consequence of apartheid and partly due to lack wealth redistribution, Namibia has one of the highest levels of income disparities in the world. The huge discrepancies in population incomes translate into a gini-co-efficient of 0.7. The latest Household Income and Expenditure Survey of 2004 claimed a reduction in the gini-co-efficient of 0.6. On average, medium income countries have a gini-co-effiecient of 0.43.

This inequality is also due in part to the historical apartheid legacy. Many black Namibians were relegated to rural and informal economies whilst the white minority was concentrated in the formal urban economy. The GDP per capita figures that gave rise to Namibia being classified as middle-income country is therefore grossly misleading. Due to this classification, the international donor assistance to the country has declined as many donors have either reduced or totally discontinued their assistance to Namibia.

2.1. Employment

The majority of Namibian households depend on formal employment for survival. More than 30% of Namibians are employed in the primary industries such as agriculture, forestry, fish processing, mining and quarrying. However, this sector that showed the worst decline in recent years. Available national figures for 2007 show a decline of 16.2% in the growth of fishing and fish processing on board. Growth in the mining and quarrying sector stood at around 15% 2006 and 2007. Secondary industries such as manufacturing, recorded a decline of 18.2% in 2007 (BON, 2007). This was due to external factors such as the rising fuel prices as well as factory closures in Namibia. Manufacturing, electricity and water are major employment sub-sectors. Poor growth in these sub-sectors affects employment and labor relations.

In the secondary sector, construction grew at the rate of 28.6% in 2006 compared to 3.9% in 2005. National accounts figures indicate a 32.9% growth in 2007. However, growth in this sub-sector is more likely to increase the number of jobs of temporary, casual and low skills categories. There was also a slowdown in the growth of tertiary industries such as finance, wholesale, retail trade, hospitality, transport, real estate and other services. Real growth in this sector was 4.5% in 2006 and available national figures for 2007 indicate a slowdown to the rate of 3.3% (BON, 2007). Services have the biggest comparative and competitive advantage for Namibia. A decline in this sector negatively affects employment growth and labour relations.

2.2. Unemployment

Namibia is faced with a bigger challenge of jobless economic growth as the economic growth was not accompanied by an increase in job opportunities. Currently, about 40% Namibians are unemployed. In order to understand just how many people in Namibia are without work will depend on the definition of unemployment. The Namibian government's unemployment definition is based on three criteria, namely: *being without work*, *being available for work*, *and seeking work* (NLFS, 2004).

The 'strict definition' of unemployment excludes those individuals (15-65 years old) who are without jobs and available for work, but who are ***not*** actively seeking work. The 'broad definition' of unemployment on the other hand regards every person who is 15-65 years of age and without work but available for work as being unemployed, whether he/she is looking for work or not. According to the 2004 labour force survey unemployment in Namibia according to the 'broad definition' stood at 36.7%, whilst the 'strict definition' resulted in an unemployment rate of 21.9%. When you add under-employment the current estimates are 42 percent (NLFS, 2004)

In terms of regional breakdown, the far north and north east's regional figures on unemployment were even more depressing. In 2004, the rural unemployment rate stood at 44.7 per cent. This number was significantly higher than the rate in urban areas which stood at 29 per cent. Unemployment in Namibia also has a gender dimension, as significantly more women (43.4%) than men (30.3%) were unemployed. If these figures are broken down further, the average female unemployment stands at 52 percent. Young people are the hardest hit, as 65% of those between the ages of 15 and 19 and 57% of those aged 20 to 24 years are said to be unemployed. On the other hand, the unemployment rate is significantly lower (16-21%) among those between 45 and 59 years of age (ibid: 3, 66 and 68).

Unemployment in Namibia is of a long-term nature, as 56% of the unemployed have been jobless for two years or more. Another 17% have been unemployed for 1-2 years while only 5.3% of the unemployed population has been without a job for less than three months. There was no significant difference between men and women regarding the duration of unemployment. However, there was a difference between urban and rural areas as the unemployed in the rural areas tended to be out of jobs for longer than those in the urban areas. Long-term unemployment (two years or more) in rural areas affected 60.5% of the unemployed compared to 49.9% in urban areas (ibid: 69).

Using the 'strict definition' of unemployment in the context of the Namibian labour market is problematic. The criterion 'actively seeking work' for classifying the unemployed may not be accurate, as many unemployed people may have stopped looking for work, not because they do not want to work, but simply because they may be demoralised and have given up hope of finding a job. Others may not bother to seek work as they witness the fruitless efforts of their friends and relatives. Thus, the criterion 'not seeking work' may not be relevant in a labour market that is characterised by mass unemployment.

2.3. Significance of wages and salaries in Namibia

Many Namibians (47%) are dependent on wages and salaries as the main source of income. In urban areas, this figure is as high as 74 per cent (NHES, 2006). The majority of Namibians do not have a secondary source of income. They therefore do not have any other source of income other than wages and salaries. The reality is that many Namibians and their dependants rely on nominal wages and not real wages. This is because salaries are hardly-ever adjusted by inflation. In the case when inflation was considered, it was often the only variable that is considered.

2.4. HIV/AIDS and other communicable diseases

The AIDS epidemic is a proving to be a serious threat to national development. The country's infection rate is one of the highest on the continent and it shares its eastern border with Botswana which has the second highest rate of over 24%. In 2001, there were an estimated 210,000 people living with HIV/AIDS, and the estimated death toll in 2003 was 16,000. In north and central Namibia, malaria is also posing a serious threat. The malaria problem seems to be compounded by the HIV epidemic. Research has shown that in Namibia, the risk of contracting malaria is 14.5% greater if a person is also infected with HIV. The risk of death from malaria is also raised by approximately 50% with a concurrent HIV infection. Given infection rates this large as well as a looming malaria problem, it is indeed difficult for the government to deal with both the medical and socio-economic impacts of this epidemic.

3. Mining industry in Namibia

The Namibian economy is heavily dependent on the extraction and processing of natural resources such as minerals. Mining has therefore been one of the main contributors to the Namibian economy for a long time. Mining provides essential revenue for the Namibian government, contributing almost 25% of the national income between 1990 and 1997. Diamond production totaled 1.7 million carats in 2002 and generated over U$500 million in export earnings. In 2006, the mining industry generated N$11.4 billion (BON, 2007) and confirmed that the mining industry continues to be the backdrop of the Namibian economy. For a long time, only diamond mining visibly contributed to GDP. However, for the first time in 2006, non-diamond mining activities contributed to revenue significantly. These non-diamond activities increased from a low of 4.5 % in 2005 to a high of 51% in 2006. The former President of the Chamber of Mines, Mark Dawe, was quoted in an English daily newspaper in 2007 saying:

> *The increased diversification of Namibia's mining sector away from diamonds is a very healthy development for the future of our country (New Era, 24 April, 2007).*

Namibia has five major mining operations. These are NAMDEB, Rosh Pinah, Rossing, Tsumeb Corporation and Navachab. These operations generate more than 95% of the mining income. NAMDEB, a diamond mine located in the Sperrgebeit, is jointly owned by the Namibian government and by De Beers Centenary. Rossing is the fifth biggest uranium mine in the world and is located just east of Swakopmund. The Skorpion zinc mine which was opened in 2003 by Anglo American cost N$454 million to build and is projected to produce 12,500 tons of pure zinc per month. Copper and other base metals are mined and smelted at Tsumeb, whilst Gold is mined near Karibib.

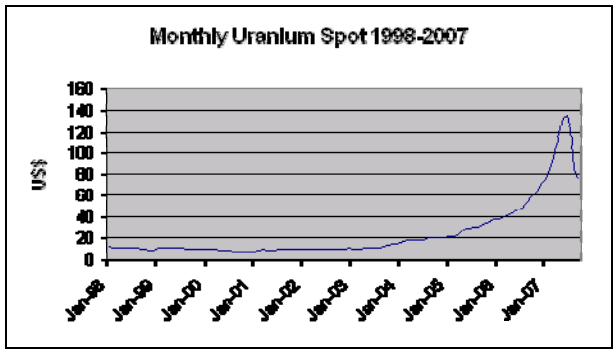
Presently, diamonds and uranium account for the bulk of the country's total export sales but Namibia is rich in a variety of minerals with 30 different commodities being produced from approximately 40 formal mining operations. In addition to the deposits of gold and silver, Namibia has deposits of the base metals copper, lead and zinc, and industrial minerals salt, graphite, marble, fluorspar and limestone. The semi-precious stones rose quartz, amethyst, agate and tourmaline and the dimension stones such as granite and marble can also be found. One of the main challenges facing Namibia relates to the fact that in most cases the minerals are exported in raw form and value addition is by no means done in Namibia.

3.1. Uranium mining

In Namibia, the exploration and export of uranium is changing. The ever increasing global demand for to fuel uranium nuclear power has made Namibia an attractive destination for uranium exploration. Namibia is the fourth largest exporter of non-fuel minerals in Africa and the world's fifth largest producer of uranium. There has been significant investment in uranium mining and Namibia is set to become the largest exporter of uranium by 2015. Currently, Namibia is the world's 5th largest uranium producer and is said to be supplying 8% of the annual world demand. The government has responded to the rising uranium prices with excitement:

> *Namibia should consider exploiting its uranium ore reserves in the light of rising world uranium prices' (Mines and Energy Minister, Erkki Nghimtina).*

As echoed by the words of the Minister, Namibia has emerged as a new frontier for uranium investors. The recent increase in uranium exploration and mining in Namibia is partly attributed to the increasing worldwide demand for uranium. Warning by international energy experts that fossil fuels like oil, gas and coal will be depleted in about three decades have sent uranium prices skyrocketing. The price of US$10 per pound of U_3O_8 was relatively stable for many years, reaching a high of U$135 in mid 2007 and then declining to U$64.50 in July 2008 (www.uxc.com/review).



Source: (www.uxc.com/review).

In Namibia uranium deposits are mined in open pits, as this practice makes it more cost effective than underground mining. However, open pit mining is more hazardous to human health and the environment because of dust residue. Most uranium resources contain only a fraction of uranium: 1,000 kg of ore leads which leads to about 500 grams of usable uranium. The mined uranium ore is crushed and then leached to dissolve the uranium, which is then separated and precipitated as a concentrate containing 90% or more uranium oxide (U_3O_8). This granular concentrate is generally referred to as yellow cake. The remains called tailings are still radioactive and are usually disposed into the pits. There is the possibility that uranium and chemicals used during the leaching process are washed into the ground and surface water, contaminating it in such a way that the water cannot be safely utilised anymore (Earthlife Namibia, 2008).

3.2. Laws governing mining activities in Namibia

After independence, the government of Namibia enacted some pieces of legislations to govern Namibia's minerals, even though much of the legislation is not tailored to address the mining of specific minerals such as uranium. Nevertheless, Namibia's constitution addresses conservation and protection of natural resources. Article 95 (I) states:

> *The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory.*

In 1993, the government of Namibia received funding from the United States Agency for International Development (USAID) through its Living in a Finite Environment (LIFE) Project. The Ministry of Environment and Tourism with the financial support from organizations such as USAID, Endangered Wildlife Trust, WWF, and Canadian Ambassador's Fund, together formed a Community Based Natural Resource Management (CBNRM) support structure. The main goal of this project was to promote sustainable natural resource management by giving local communities rights to wildlife management and tourism (www.mbendi.co.za).

There has been some criticisms labeled against the government's lack of legislative action and policies on nuclear fuels. An organization such as Earthlife constantly proposes that the continued treatment of uranium mining like any other mining activity is problematic. The far-reaching implications associated with uranium mining need separate attention. Social researcher David Fig argues

that the government is taking too long to act on what is stated in the Constitution. He commented:

> *It would seem that the Constitution insists that the state protect the Namibian environment. Nevertheless, environmental legislation has been elusive. It took seventeen years after independence for the Environmental Management Bill, many years in preparation, to be submitted to the Namibian parliament in December 2007. Technically the Act still remains to be promulgated in June 2008. As a result, it is not yet in effect. Instead, a number of the Acts of the apartheid South African parliament and ordinances of the colonial administration still apply in Namibia, even though within South Africa successor bodies have long repealed or rewritten these laws (2008: 6).*

Meanwhile, the mining industry is governed by the '**prospecting and mining Act** (**Act no 33**) **of 1992'**. This Act does not make provision for environmental assessment. The Act also does not deal with Uranium mining as a special category. The Act is being reviewed. In this regard, an official from the Ministry of Mines and Energy said:

> *In the very near future, Namibia could become the 3rd largest uranium producer in the world. The minerals and prospecting act 1992 covers all prospecting and mining of all minerals. We realized that uranium is a strategic resource that we need to closely regulate. We therefore thought of giving it the importance that it deserves. World wide the producers of uranium have separate legislations covering those activities. In the past we only had one uranium mine and it was easy to look at it in terms of the minerals act.*

3.2.1. Namibia environmental laws

The Ministry of Environment and Tourism also has some policy guidelines. In 1994 the Ministry introduced a **policy on environmental assessment**. The guidelines state that assessments need to be undertaken by the developer of any mining or beneficiation projects. *'The mandate to oversee these practices emanates from legislation that has yet to be passed; as such, currently the policy in its strictest sense has no legislative base' (Fig, 2008).*

Our discussion with Mr. Ngitila of the Ministry of Mines and Energy revealed that the government has a number of procedures in place regarding environmental management. These are procedures that have to be followed when setting up a mine. According to Mr. Ngitila, these procedures are particularly applied in the case of uranium mining.

One of the most important pieces of legislation for the mining industry is the **'mining and prospecting in a protected areas and national monument policy'.** This document outlines procedures that an applicant has to fulfill when they are given an EPL in a protected area. It also states that an Environmental

Impact Assessment (EIA) has to be conducted. The EIA has to be accompanied by an Environmental Management Plan (EMP). Conducting the EIA is the responsibility of the company which has to appoint a 'competent professional or team' to carry out the EIA. The legislation also states that it should be:

> *A consultative process including all the stakeholders, all the affected interested parties. They have to be consulted and they have to be informed about the development and then that process is part of EIA. We consider the EIA incomplete in the absence of the full consultation (Interview with Mr. Ngitila, 13 August).*

The EIA is then submitted to the Ministry of Environment for registration. Once it is recorded, the Ministry will study the terms of reference. Should the Ministry feel that there are some crucial elements lacking, the Ministry will raise the missing issues. Those will have to be considered in the final terms of reference. The people responsible will comment on the draft and thereafter the will Minister reviews the report:

> *If we feel we do not have competencies to review a specific report then we subject that report external review at the cost of the proponent. We inform the proponent that we are going subject your report to an external reviewer and we will submit the invoice to them. That is the requirement. We don't pay for the external review and that will also be the same when the new law comes into operation (Interview with Mr. Ngitila, 13 August).*

There is also a new law called the **'Environmental Management Act 7 of 2007'** which was passed in December. The Ministry is busy developing instruments for the implementation of the new legislation. By the time of writing, most of the instruments were already submitted to the Attorney General's Office. *'Hopefully, everything would be in place by the end of the year and by early next year we will be able to implement that particular act. This act gives power to the policy that I mentioned earlier' (Mr. Ngitila, 13 August).*

The new Act is expected to be more progressive. Unlike in the past, it will be mandatory for companies to carry out EIA for any listed activities. Under the new Act the listed activities are those activities that need to be subjected to EIA. This list is part of the regulations which will includes mineral exploration, mining, setting up factories, construction of new roads and so on. *…' and we are looking forward to the implementation of the act because we will feel more empowered' (Mr. Ngitila, 13 August).*

The Act also makes provision for the establishment of an Environmental Commission office as well as a Sustainable Development Advisory Council. The new act will put more emphasis on administration of EIA and much broader environmental management. The new law outlines the environmental management principles and also makes provision for the Minister responsible for the environment to develop good relations with stakeholders. For a long time the

Ministry of Environment lacked capacity in the area of monitoring for compliance. The Ministry therefore intends to employ more environmental officers who will monitor compliance.

> *It will no longer be just a matter of submitting a report; there will be a follow up. There are mandatory report requirements and there will be checks and balances. This will be to find out if what you are reporting is what is happening. There would not be a second Ramatex in this country (Mr. Ngitila, 13 August).*

The Ministry is drafting a **'bill on pollution and waste management'.** The intention of the bill is to bring waste management and pollution control into one stop type of action. This is in order to be able to easily set standards and procedures. This EMA is the outcome of the environmental law reform and will include a bill on pollution and waste management.

There is another piece of legislation that governs minerals in Namibia, called the **minerals policy of Namibia.** In the executive summary of the policy the policy is justified on the following basis:

> *Globally, environmental issues in mining have gained prominence. All minerals (sic) producers have begun to pay attention to environmental concerns as poor practices deter investment. Government will ensure that the development of the Namibian mining sector is environmentally acceptable and includes consideration of the health and safety of people (Mineral Policy of Namibia, 2002: IV).*

The policy is written in an introspective manner. The writers highlighted most of the shortcomings of how the environment is being damaged and currently managed by mining companies. The Ministry also realizes the importance of a coordinated effort between the different stakeholders such as the Ministry of Mines and Energy, Ministry of Environment and Tourism, Ministry of Health and the mining companies. There is however not much emphasis on cooperation between the different stakeholders and people living in the areas where mining is taking place.

Namibia's environmental is outdated to a large extent and the Ministry has embarked on a process of reform. This process is taking longer than expected. Previously, various government Ministries were responsible for various pieces of ordinances. The pollution and waste management falls under the Ministry of Health and Social Services, which also administers the control of hazardous substances. A number of laws such as 'waste water discharge' are still under the control of the department of water affairs. This falls under the Ministry of Agriculture, Water and Forestry. Due to this fragmentation of environmental laws, the government decided to have one 'umbrella policy'.

Another important body in Namibia is **the Chamber of Mines of Namibia** (CoM). This body was established to promote, encourage, protect and fostering

the mining industry (Namibia Trade Directory, 2008: 88). After decades of ongoing uranium mining, the Namibian Chamber of Mines has opened a Swakopmund branch in 2007. This branch will deal with radiation protection issues in the uranium industry and will help with the development of best-practice standards for occupational health and environmental management for uranium mines.

3.4. The need for a new law on uranium mining

The Ministry of Mines and Energy is currently drafting a new law to be tailor made for uranium mining. The minerals and prospecting Act 1992 covers all prospecting and mining of all minerals does not address uranium as a special kind of mineral. The current Minerals Act does not make provision for the control of uranium exports and safeguards as per guidelines of the International Atomic Uranium Agency. The current Act has a section that prohibits the exploration and mining of uranium without the consent of the minister. Namibia is signatory to the safeguards agreement and has been implementing the guidelines as per International Atomic Uranium Agency. Uranium from Namibia has to be exported within the frame work of the Agency. The new law is to develop clear regulations to guide the industry as Namibia is currently experiencing an increase in the number of mines: An official from the Ministry of Mines therefore stated:

> *We realised that uranium is a strategic resource that need closer regulation. We thought of giving it the importance that it deserves. World wide the producers of uranium have separate legislations covering those activities. In the past we only had one uranium mine and it was easy to look at it in terms of the minerals act (Interview with Mr. Shivolo, Director of Mines, 27 August).*

The renewed interest in Namibian uranium is linked to the notion that nuclear power might fill current energy gaps. According to the Director of Mines in the Ministry of Mines:

> *Last year or two years ago, Cabinet mandated our Minister to look at the possibility of nuclear energy generation. In that respect if you don't have a legislation that looks into those issues it would be impossible. How do you build and operate a nuclear energy generation plant if you don't have the law that governs it? With all the above we found the need to have a policy legislation and regulation in regard to the uranium and nuclear industry (Interview with Mr. Shivolo, Director of Mines, 27 August).*

According to the deputy director of mines, nuclear energy *'is a possibility given the current trends in power supply. If it is the only option we have to go then we have to'*. David Fig however warns that the nuclear energy industry is much more complicated than we might think. The state will have to invest a lot of money whilst the industry will bring very little into the government coffers.

The industry is inevitably linked with intractable technical and security problems such as the disposal of high-level waste and the possibilities of the proliferation of nuclear weapons. The insurance industry is entirely allergic to nuclear power, so that the risk is entirely borne by its consumers (2008: 19).

As a source of energy, nuclear power is one of the more expensive options. It takes many years for a new plant to start operating. Furthermore, the industry is notorious for cost overruns and for not meeting construction deadlines. Uranium is only able to make up 6% of the cost of operating a reactor. This figure may need to be adjusted to reflect the current spot price. Even if prices remain constant they are not likely to be the only reason for reactor project cancellations. Other factors such as too many sources of uranium emerging at the same time can lead to a drop in the spot price. This may potentially erode the chances of the new mines to be profitable (Fig, 2008: 5).

We did not obtain a copy of the new legislation because it was not ready. It was still to be reviewed by the Minister. Thereafter, it will be submitted, before it becomes public. Nevertheless, Ms. Itamba, the deputy director of Mines, said the new policy is expected to be an encompassing piece of legislation that will also include clauses on radio active waste and environment protection. She said:

… The draft policy will provide for the implementation of the treaties that Namibia has signed with the International Atomic Energy Agency and the protocols that we have entered into especially the safeguards agreements under which uranium is treated. It will also make provision for the exploration of uranium mining as well as the radio active waste management and protection of the environment against uranium mining. It will also include a section on how we can add value to our uranium (Interview with Ms. Itamba, Deputy Director of Mines, 21 August).

With regard to value addition, in March this year, the government granted permission to the Ministry of Mines to pursue plans for the nuclear generation plant and beneficiation programs. *'Cabinet granted approval to the Ministry of Mines and Energy to develop a Nuclear Regulatory Framework and to pursue the nuclear power and uranium beneficiation strategy' (New Era, March 3, 2008).*

We were assured that a consultative process will take place before the bill is passed. When asked which stakeholders will be consulted, Mr. Shivolo stated: *It will be a combination of government institutions, the Chamber of mines, NGO's, and the public. A number of workshops with the public will also be held.* We are therefore hoping that this report will be useful in the formulation of the new law.

As of September 2007, **the Commonwealth special advisers from the Economic and Legal Section Secretariat's external link Special Advisory Services Division was tasked to** undertake a review of Namibian law as it

relates to uranium mining. The team will review the current Minerals Act, especially pointing the loopholes in the existing law. They will also have to advice government on the new provisions to be included (obtained from http://www.thecommonwealth.org/news, accessed on September 23).

3.5. International conventions on mining

There are a number of international instruments that informs mining in general. Namibia has rectified some such as the:

- **SADC Protocol on Mining**. This protocol adopted in 1997, intent to foster cooperation and coordination in the effort to attract more investment and increased production of the mining sector in the SADC region. Namibia has rectified this protocol (accessed from http://www.sadc.int, on 22 July).
- **The Atomic Energy and Radiation Protection Act.** Namibia assented to this Act in 2005 but will only commence on a date that the authorities will decide on. Only section 44 came into effect on 16 May 2005
- **Radiation Protection Convention, 1960.** This convention has adopted certain principals to protect workers against ionizing radiations. Article 2 (1) of this convention states that: 'this convention applies to all activities involving exposure of workers to ionizing radiations in the course of their work'
- **Occupational Cancer Convention, 1974.** This convention was adopted as a measure to prevent and control occupational hazards caused by carcinogenic substances and agents
- The **Working Environment (air pollution, noise and vibration convention, 1977)** concerns the protection of workers against occupational hazards in the working environment due to pollution, noise and vibration
- The **Occupational Safety and Health Convention, 1981** is concerned with occupational safety and health and the working environment. In Article 4 (2) it is stated that 'the aim of the policy is to prevent accidents and injury to health arising out of, linked with or occurring in the course of work, by minimizing, so far as is reasonably practicable, the causes of hazards inherent in the working environment
- The **Occupational Health Services Convention, 1985** is concerned with occupational health services. Article 1(i) states that 'the requirements for establishing and maintaining a safe and healthy working environment which will facilitate optimal physical and mental health in relation to work. Sub-article (ii) states that 'the adaptation of work to the capabilities of workers in the light of their state of physical and mental health. These conventions which are seemingly important for uranium mining have not been ratified by Namibia (www.ILO.org. accessed June 2008).

3.6. Procedures to acquire a mining license in Namibia

In essence, before a mine opens, exploration has to determine if there are sufficient deposits which warrant mining activities. Exploration has to be approved by the commissioner responsible for mining. This should be channeled through the ministry of mines to the ministry of environment for consideration. The Ministry has to be satisfied before issuing what is called '**the environmental clearance certificate'**. The prospector has to apply for a mining license. The Ministry of Mines would not issue a license without having an approved environmental assessment or without obtained an **environment clearance certificate** from the ministry of environment.

> *The mining license is not even approved by the Ministry of Mines and Energy alone; it is approved by the committee which recommends to the Ministry of Mines for approval. The committee has to cross check if all the requirements are in place for them to make that recommendation. If the proponent submit their proposal for mining license and is not accompanied by an approved environmental assessment, then it will not be approved. It will be considered as incomplete (official from the Ministry of Environment and Tourism).*

It is essential that a proper ESA is conducted involving experts in all relevant fields. Interested parties need to be involved from beginning and the report must be reviewed by independent experts. The reviewers' feedback has to be considered before a license is granted. A special program to keep track of air, dust, soil, water and noise pollution has to be developed. This maybe done by the mining company, but must be monitored by an independent body. The entire process must be transparent and concerns from the public must be responded to.

The Ministry of Environment and Tourism is party to the Environmental contract and they are therefore expected to carry out visits to exploration sites. The license holder has to enter into an environmental contract with the Ministry of Mines and Energy and the Ministry of Environment and Tourism.

> *…Both institutions visit exploration sites. If you are found to be going contrary to the contract, you are brought to order. Mining experts don't usually visit exploration sites, they only visit mining sites. We have an arrangement to visit two to three times a year each mining site. The number mines is increasing whilst the budget and the number of inspectors remain the same. We have a budget that is approved by parliament and that is the budget that we must adhere to. If you for example schedule 20 trips to a mine before the end of the first half of the year, you would have already exhausted your budget.*

These points to a potential lack of capacity of the Ministry to carry out sufficient inspections in future. Unless these capacity constraints are addressed, proper enforcement will remain unattainable. The official of the Ministry of Mines

indicated that they are supposed to carry out routine visits to the mines to look at certain key areas. These visits are aimed at making sure that the health and safety regulations are adhered to. The Ministry of Environment is supposed to visit the companies at least twice a year, but due to insufficient capacity, visits currently only take place when problems are reported.

Our findings reveal that there are a number of procedures to be followed in order to acquire a mining license in Namibia. Firstly, all mineral rights/licenses are granted in terms of the Minerals Prospecting and Mining Act 1992. The conditions are set out as per Minerals Act from Section 67 onwards. For the application to be considered, the applicant has to proof that he/she has the technical and the financial resources to undertake the exploration project. Thereafter, a background check is done on the applicant (s).

The application fee of N$2000 (about U$250) is minimal. It is for that reason that the Ministry is receiving a lot of applications on a daily basis. The number of applications can exceed 1000 per month. This is partly due to the fact that the current Act does not limit the number of applications. Mr. Shivolo commented:

> *We are… overwhelmed with applications because any one can risk N$2000 to see if they can find anything. …On a good day or bad day we can receive more than 50 applications…. The Act of 1992 does not provide for limitations to the number of prospecting licenses. We have thought about it but the industry sometimes feels that it's a disincentive to investment. We have recently thought of limiting the number of licenses that can be granted to an individual particularly to the new entrants who are not known to us (Interview, 27 August).*

Applicants have to be clear about the location where they would like to mine. The next step is to go to the office where they do cartography in the mapping office to identity the area where the person wants to apply. All applications are displayed on the GIS map to see which areas are under licensed. If there is already a license granted for that area, the applicant has to look for an alternative location. Once the application form is completed it is submitted to the mining commissioner who passes it on to the clerks to issue the receipts and enter it on the system. The applicant is given a receipt and a number is allocated to the application. The next step is to wait for mediation. The commissioner summarizes the content of the application and submits the summary to the Minister. The commissioner also has to pass his judgment on the application when submitting the application to the Ministers.

The Ministry has a customer charter that informs the work of the directorate of mines. The charter states that applicants should receive a response from the office of the Minister within 3 months (120 days). The Ministry however acknowledges that this is not always achieved due to a number of constraints. Firstly, the Ministry is understaffed. Although Namibia generally has a shortage

of specialized skills, staff retention is a challenge in the industry. It is clear that there is a demand for experience staff in the mining industry given the boom in uranium mining in Namibia. It is possible that some mining companies are also poaching skilled staff from the Ministry of Mines. Mr. Shivolo echoed these sentiments: '*…we had staff but they were taken away by the industries that pay more'.*

The Ministry also recognizes the fact that some Namibians want to enter the mining sector, without having the necessary financial resources or the technical knowledge. In that case Namibians enter into joint-ventures with the non-Namibians who fulfill all the necessary requirements.

> *There are instances where we don't fully comply with those requirements because there are Namibians who would like to get into the mining industry knowing the limitations to Namibians. These are technical and financial limitations; we don't have enough geologists to undertake the proper explorations program. We do sometimes give licenses to Namibians who do not meet these two major criteria's although with conditions that in a specified period of time they would have concluded a joint venture agreement with somebody with those capacities (Interview with Mr. Shivolo, Director of Mines, 27 August).*

3.6.1. After the license is issued

The Ministry notifies the applicant in writing that it is ready to grant a license. Once the minister grants the license the applicant then has to follow the program as per application form. As part of the notice some standard conditions extracted from the Act as well as specific conditions that the Minister would want the applicant to adhere to are expressed. Mr. Shivolo added: *'if the area is environmentally sensitive there may be additional conditions on how you treat the area' (interview held 27 August).* The Ministry has also tried to find ways to make sure companies invest in the country as they usually promise in their application forms. In the past, applicants promised that they would invest certain amounts of money, just to entice those who would process the application. Once the license is granted, there is no way to proof if the amounts promised are really invested locally.

> *We have in the last couple of years also included a condition to try and force companies who are listed to bring money into Namibia. The money that they have proposed in the exploration program to bank it with a financial institution here. If we really want to follow up to see if they brought in money that is actually flowing down for payment of the exploration program then we will be able to establish so (Mr. Shivolo, Director of Mines, 27 August).*

Once the license is granted, the applicant is expected to start with the exploration program as indicated in the application form. The exploration program can be changed as long as the Ministry is duly informed.

An application can be rejected if it does not meet the requirements stipulated in the Act. A second application by a company that is already engaged in exploration can also be rejected if the applicant is already contravening some of the sections of the Act. Exploration is an expensive activity that sometimes funded through the stock exchange even before any mineral deposits are found. Potential investors can start buying shares even before the operation starts. The Ministry does therefore not rule out the possibility that there are some people who might simply apply in the hope of making money on different stock markets in the world. Consider the following statement by Mr. Shivolo:

> *When there is a boom you expect to have genuine applicants and speculators in the mix. I believe we receive credible applicants but also applicants who are trying to raise money on the stock exchange but will never 100% end up being used for explorations activities on the ground.*

4. Uranium companies (operating) in Namibia

Although a number of licenses have been issued in recent years, only two uranium mines are currently in operation in Namibia: the Rossing Uranium Mine located in the Namib Desert in the western part of Namibia and the Langer Heinrich Uranium Mine (LHU). Below follows a historical brief of each mine.

4.1. Rio Tinto Zinc-Rossing Uranium

During the 1970s, licenses were granted by the South African administration for the mining of uranium by Rio Tinto Zinc, in conjunction with some South African investors. The mine is located in the Namib Desert close to the town of Arandis, 65 km inland from Swakopmund. Mining began at Rössing, some 100km east of Swakopmund, in 1976. The mine eventually became the world's largest open-pit uranium mine, currently providing almost 8% of global demand for uranium.

[Here: A picture reflecting the number of tones of Uranium produced at Rossing per day].

Contracts were entered, inter alia, with Britain, France Japan, the Soviet Union, and the US. The shareholders of Rossing are: Rio Tinto 69 %, government of Iran 15%, Industrial Development Corporation (IDC) of South Africa 10%, 13 local individual shareholders 3% and the government of Namibia 3%. Even if the government of Namibia's share seems negligible, it has a 51% voting rights (Rossing stakeholder report, 2006: 1).

The contribution of Rossing to the economy is enormous. In the year 2006 alone, Rossing contributed N$158 (close to U$ 20) million to government coffers through tax revenues. Production at this site makes up about 3% of the Gross

Domestic Product of Namibia (GDP) and 10% of the country's foreign exports. Rossing Uranium contributes about 8% to the world primary uranium production. The mine has committed itself in August 2007 to a N$784 million (US$112 million) lifespan extension project that will see the mine through to 2022. This extension is due to the demand for uranium worldwide.

The mine provides employment to close to 1200 people, permanent and contract staff. By the end of 2007, the mine recorded a staff contingent of 1175 permanent employees. Due to the nature of the mining industry, there were more men than women workers. The ratio of male to female is 8 to 1. Two hundred and eighty-seven new employees were recruited in 2007 (Rossing report to stakeholders, 2007: 6). According to the Manager of External Affairs, Jerome Mutumba, the majority of the workforce is Namibian. A few expatriates are brought in to fill the gap in terms of critical skills. Most expatriates are sourced from Zimbabwe, while others hail from the USA, Australia and London (Interview with Jerome Mutumba, manager external affairs, 31 July 2008).

Rossing did not conduct an EIA before starting operations. This was confirmed by their External officer Mr. Alwyn Lubbe. He said:

> *At the time when the mine planning and construction started no formal legislation were in place for EIA studies. In fact, it was not even a well-know concept. In the case of Rossing various studies and related actions were taken in terms of identified environmental issues taken up in a environmental management plan. For example, at the time of construction of the mine it was decided to install boreholes around the tailings dam to monitor water flow. Another action taken is that all quiver trees and other plants were rescued where the open pit was excavated. These plants were then relocated to the Botanical Gardens in Windhoek where they can still be seen today (e-mail response from Mr. Lubbe, August 2008).*

4.2. Paladin Resources Ltd- Langerheinrich

Langerheinrich is the second uranium mine to be operating in Namibia. Already the presence of Langerheinrich can be felt in the Namibian mining industry. In 2007 alone, about 5 000 tons of uranium was mined in Namibia. The mine was officially opened by the President of Namibia on March 14, 2007. The mine is located in the west of central Namibia, and lies 85 km east of Swakopmund. The mother company is Paladin Resources Ltd. Paladin which is a small Perth-based mining company, and is listed on the Australian and Toronto Stock Exchanges. In addition to Namibia, Paladin has operations in Australia and Malawi. The mine is located in the west of central Namibia in the protected Namib Naukluft Park and is expected to stay in operation until 2023.

The Langer Heinrich deposit is very close to the surface and therefore relatively easy to mine. It occupies a length of 15km and a width between 50-1100 metres. From this deposit the expected yield of uranium oxide is 1.1 million tones each year for a period of at least ten years. LHU now produces 2.6Mlb of U_3O_8 through processing 1.5Mt of calcrete ore per year to take place over a 15-year period. By January 2003 it had developed a proposal for a bankable feasibility study (BFS) which was undertaken by a Johannesburg-based engineering firm GRD Manproc from February to November 2004. Much of the work for the BFS was broadly consistent with the prior conclusions of the Gencor and Acclaim research. Namibian mining legislation obliged Paladin to conduct an environmental assessment (EA). The EA report was accepted, despite the concerns raised by the environmental lobby group Earthlife Namibia.

A further prospecting license was granted in November 2006 to Paladin to explore an area of 30km2 adjacent to the western boundary of the original concession. First production was scheduled to commence in September 2006, but the mine was only opened formally on 15 March 2007. The ceremony was attended by Namibian state President Hifikepunye Pohamba, the Australian High Commissioner Philip Green and other dignitaries. Pohamba stressed the Namibian government's strong support for foreign investment. Soon after the ceremony the first shipment of 10 tonnes of U3O8 went to US firm Converdyne, which converts uranium oxide to uranium hexafluoride for enrichment purposes.

Over the past three years Paladin share prices have increased sharply. This has made them the second-best performer among the 1879 stocks quoted in Morgan Stanley Capital International's World Index (O'Brien, 2007). Not all has gone smoothly for Paladin. Increase in production has created problems especially to equipment failure in heat exchange issues. This has resulted in a reduction of production from an anticipated 400 000 lb to 270 000 lb in June 2007 (World Nuclear News, 13 June 2007).

Paladin has also suffered another blow. In Malawi the company faced court action by the coalition of NGOs, which aimed at challenging irregularities in the conduct of Paladin's environmental assessment of the Kayelekera uranium mine. The intervention of a civil society coalition forced concessions out of Paladin. The company was forced to provide a number of social provisions to affected communities in the Karonga district. However, these concessions split civil society, one section of which was opposed to the mine in principle, for environmental reasons (Presentation by Rafiq Hajat to meeting on SADC natural resources, Ekurhuleni, South Africa, 17 March 2008).

The fact that the mine is in the protected Namib Naukluft Park, worries the environmental lobby groups. The issue of water availability and usage is of concern to Earthlife Namibia. Earthlife Namibia appealed to government to stop

mining operations at Langer Heinrich, because mining uranium would not only pose health hazards but also environmental concerns such as loss of biodiversity and possible ground and surface water contamination – one of the serious issues that have not been addressed properly in the draft EIA. The Oeko-Institute states that the EIA underestimates the radiation doses fourfold and the proposed tailings management concept would have serious flaws.

4.3. Ownership and clientele of Namibia's uranium

The major receivers of Namibia's uranium are Japan (41% in 2006 and 28% in 2007), North America (28% in 2006 and 30% in 2007), Europe (17% in 2006 and 13% in 2007 and Asia (14 % in 2006 and 29% in 2007). (Interview with Jerome Mutumba, manager external affairs). We did not obtain further information with regard to the individual countries to which uranium is exported as such information is classified. *'The company has customer confidentiality clauses in our sales contracts, thus we cannot reveal this information'* (an e-mail response from Mr. Lubbe, Rossing Communication's officer).

What was obvious from the company report was the increase in the amount of uranium exported to Asia in 2007. This can be explained by the demand from China and India. The director of mines also mentioned that most of the investors were from Australia, Canada, South Africa, Namibia, China, France, United Kingdom and recently Russia. He elaborated:

> *What Australia has done which is different from other countries is that they have graduated a number of junior companies into medium exploration companies which basically discover ore bodies and sells them to major companies for development. In that process several geologist and mining engineers have formed their own companies to look for deposits all over the world so that they can sell them to major companies to develop. These ore bodies are sold to any one in the world. The Namibians usually don't have the technical and financial capacity and therefore opt for joint ventures with partners from either Australia or South Africa.*

It is clear that Namibia's uranium oxide is exported in raw form. It is send to countries that have converters and where it is enriched. This was also confirmed by Ms. Itamba of the Ministry of Mines. *'It goes to countries with uranium converters these are France, USA, and Canada' and China (interview with Ms. Itamba, 22 August).* The Ministry maintains that before any uranium is exported, the company provides a sales agreement to the directorate of mines for evaluation. In the sales agreement provision must be made for a safeguard clause that states that 'uranium can only be used for peaceful purposes'. This agreement is undertaken between the company and buyer.

Once, the Permanent Secretary is satisfied he gives his recommendation to the Minister and then an export permit is issued. The sales agreement makes provision for the quantities, origin, deliverables, warranty, and the sales price. The price is pre-fixed between buyer and the company, although the price cannot be amended without the Ministers consent. If the company wishes to change the price, they have to apply again for the price clause to be changed in the sales agreement. Mr. Shivolo concluded:

> *This is done for security reasons so that what ever leaves Namibia is only used for that particular purpose because in the agreement- the use of uranium by a specific buyer is mentioned. If this was not done the companies can change the agreements and the uranium may be used for any other dangerous purposes (interview with Mr. Shivolo, August 27).*

In all agreements a 'safeguard' clause has to be included. The export permits are valid for one year. If the company wants to increase or decrease the quantity of exports it needs to obtain permission from the Minister. The sales agreement also stipulates the years the company will be exporting to a certain buyer. Most of the agreements are long term. The Ministry does not restrict the quantity exported in any given year. The Ministry of mines reports Namibia's uranium exports to the Atomic Agency through the Ministry of Health.

4.4. Rossing physical and social investments

Rossing Foundation is very well known by many urbanites in Namibia. Rossing has used the Rossing foundation as an instrument through which social and financial support is offered to a number people, communities and organizations. The Rossing foundation has four main objectives:

> *1. To further the education of all Namibians in order to achieve greater national productivity and to enhance lifelong learning;*
> *2. Encourage the creation of and or to create opportunities for people to use their education;*
> *3. To promote the advancement of the living standards of all people in Namibia;*
> *4. and to do any act or thing which, in the opinion of trustees, will benefit Namibia or any or all of its inhabitants (Rossing stakeholder report, 2006: 19).*

Rossing Uranium has made a significant contribution to skills development in Namibia. Rossing offered N$6 million to the Namibian government at independence to assist in the establishment of the Namibian Institute of Mining and Technology (NIMT) in Arandis.

[Here: Picture of the institute and the town of Arandis]

The Institute provides training for all industries including fishing, manufacturing, agriculture, oil exploration and the motor assembly industries. Rossing's training focuses on company-specific practical management development aimed at all frontline supervisory staff. It offers bursary awards, and adult education in addition to the vocational skills training in electrical and mechanical engineering (*Reviewing Rossing*, 1996). This financial support to some NGOs made them dependent on the mining company. It is against this background that Fig (2008) argued:

> *As the NGO sector became increasingly dependent on the Foundation's philanthropy, much of the public criticism of the company's poor health and environmental practices and the unregulated illegal trade in uranium abated. The Mineworkers' Union of Namibia (MUN) was too fragile, especially after the crushing of a major strike in 1978-9, to contest the dangerous working conditions at Rossing, although in clandestine meetings with the author in 1987, some workers revealed their awareness of significant malpractices (also see Rogers, 1980).*

4.5. Effects on water and electricity supply

In semi-arid countries such as Namibia, access to water is a major challenge for the development of uranium mine projects. Uranium mining relies on volumes of water for production. In 2006 alone, Rossing used 3.3 million m3 of water. This translates into 28% of the total coastal water usage. Electricity consumption at Rossing translated into 205, 614 MWh which translates into 6% of total electricity used in Namibia (Rossing stakeholder report, 2006: 1).

Namibia's local water supplier NamWater could provide only the water required for Paladin's newly opened Langer Heinrich mine, using 1.5 million cubic meters per annum. Further uranium mines have to build desalination plants at the coast to meet their fresh water demand. The demand of 25 million cubic meters per annum for Uramin's Trekkopje mine project alone is higher than that of all consumers in the area combined. Concerns were raised about the impacts of the desalination plant on sea life, and of the impacts of the pipeline on the unique lichen fields in the area, among others. The desalination plant is however already commissioned.

4.6. Forthcoming uranium investments in Namibia

Since Paladin received permission to mine uranium inside the Namib-Naukluft Park, three more companies based in Western Australia have begun to prospect within the boundaries of the protected area: Husab Extract Resources is trying to commercialise the Ida Dome area within Husab property. On 19 October 2007, it announced the success of its preliminary scoping study; although no substantial exploration took place that ensures the presence of mineral resources.

Another one Goanikonte Bannerman Resources which was included in 2005. In September 2007 it tabled the results of a detailed scoping study into the economic viability of its Namibian operation. The company mentions the possibilities of a strong cash margin and indicated that the starting date will be 2010 (Earthlife Namibia, 2008, Pamphlet)

The third is the Tubas Reptile Uranium Namibia (Pty) Ltd. This company is exploring this site along with the adjacent sites of Tumas, Ripnes and Aussinanis. The company is fully owned by Deep Yellow, of which Paladin (the operators of Langer Heinrich) is an 11% shareholder. Tubas was formerly owned by Anglo American. In addition, two sites north of the park are being exploited: Trekkopje and Valencia. In the case of Trekkopje, national utility Namwater admitted in April 2007 that it cannot supply sufficient quantities of water for the mining project ((Earthlife Namibia, 2008, Pamphlet).

On the other hand, UraMin Inc, the Canadian owned is expected to build desalination plant of the capacity of 15 million cubic metre per year near Wlotzasbaken on the coast (Allgemeine Zeitung, 5 April 2007). More recently the company has been bought by the French state nuclear utility, Areva, and has offered 35% of its output to Chinese buyers. Valencia, run by Forsys, a Canadian company, intends to mine 90 million tonnes over eleven years, starting in 2008-9 (The Namibian, 27 April 2007).

The Korea Electric Power Company entered into discussions with Forsys about future joint ventures, including Valencia on November 1, 2007. The company received permission in February 2008 to extract water from boreholes in the subterranean Khan River and a 'palaeo channel'. Immediately, the owners of a tourism operation located 5km from the Valencia site challenged this permission in court, arguing that their operations would be impacted upon negatively should most local water be abstracted by the mine. It transpired that permission had been granted without any conduct of empirical studies on the amount of water available in the Khan River and the 'palaeo channel' (Menges, 2008).

The court turned down the application, and is now submitted for appeal (Earthlife Namibia, 2008 pamphlet). However, in the interim, the government has accepted the Environmental Impact Assessment report and the management plan for the mine (Namibian Economist, 8 June 2008). Russian and Japanese firms have also expressed interest in investing in Namibian uranium mining projects (WISE, 2007:1). However, in April 2007, Minister Erkkie Nghimtina announced a moratorium on further applications (Allgemeine Zeitung, 25 April 2007). In this regard, The Permanent Secretary in the Ministry of Mines was quoted as saying: *'It's a matter of regulating the issue of licenses. Everyone is running to Namibia for uranium, and we don't want every Jack and Jill mining uranium' (The Namibian, 14 February 2007).*

Despite being blessed with a lot of potential for solar and wind power, Namibia is investigating the possibility of using nuclear power as an energy source. In the meantime, Namibia heavily relies on the import of electricity from the South African grid (Fig 2005a). When outages are experienced as a result of problems at the Koeberg nuclear power station outside Cape Town, exports are limited to Namibia.

Early in 2006, the Namibian government announced – at a workshop on renewable energy -- that it was considering its own nuclear power supply (Dentlinger 2006). In pursuing this option, the Namibian government is engaged in talks with both Russia and South Africa. It is noted that Prime Minister Nahas Angula has entered discussions with Russian nuclear energy officials regarding the potential use of Russian nuclear energy technology. Namibia is concerned about the energy deficit resulting from cutbacks of electricity imports from South Africa. However the projected energy deficit is 300 megawatts, far less than the output of a conventional nuclear reactor. Two Russian companies, Renova and state-run export bank Vneshtorgbank, possess licences for uranium extraction in Namibia (Fig, 2008).

If these planned projects materialise, Namibia could become one of the top three uranium producing countries in the world. In August 2006, the Permanent Secretary in the Ministry of Mines and Energy stated that the government is looking into the possibility of creating a uranium power plant in Namibia. This was confirmed during a media briefing in February 2008 wherein Cabinet announced that Namibia intended to build a nuclear power station and a uranium processing plant as a medium term plan to fight the energy crisis currently facing the SADC region.

However, the Cabinet assured Namibians that before plans to build a nuclear power station or a uranium processing plant are effective, a nuclear regulatory framework needed to be put in place. Presently Namibia has no legislation on the nuclear industry. Despite all the uranium mining activities, Namibia continues to be a mere supplier of uranium rather than a user of it. The workers remain workers remain suppliers of labour rather than owners or shareholders. It seems that currently the short-term economic benefits seem to outweigh the social concerns and all dangers associated with uranium mining.

In view of the current demand for uranium, several countries are changing their policies for granting licenses. In Niger, where so far uranium was exclusively mined by subsidiaries of Areva (based on former colonial power France), new exploration licenses were granted to a number of companies from other countries. In Uganda, President Yoweri Museveni has ordered the Ministry of Energy to halt giving out concessions for the exploration of the newly found

uranium deposits in the country. After having granted uranium exploration licenses to a number of exploration companies, Namibia, in February 2007, placed a moratorium on granting further licenses, until a new policy is developed. It is only now that the Namibian Chamber of Mines plans to develop radiation and environmental standards for uranium mines. One can argue that for over 30 years Rossing Uranium Mine has been 'self-regulating'.

Of particular concern is the fact that the 'public involvement' is left to the applicant, rather than the regulator. This leaves only rudimentary opportunities for stakeholder involvement. For example, there was a period for stakeholder comments of just over two weeks for the Draft Environmental and Social Impact Assessment Report for Uramin's Trekkopje Uranium Project. Such limited time set aside for public involvement can lead companies into taking advantage of this process.

5. The views and experiences of workers

5.1. Working at Rossing

The workers we interviewed were employed by Rossing for different lengths of time ranging from 2-31 years. They worked in different sections of the mine. Some mentioned that they have worked at almost all the plants in the mine. Almost all workers interviewed regarded Rossing is a 'good company'. Good related to job security and working conditions. Even in the absence of a national minimum wage in Namibia, Rossing Uranium pays above-average wages. Wages were said to be extremely attractive with competitive remuneration packages inclusive of pension and medical schemes, generous annual and sick leave and generally some form of housing benefits. Many reported that Rossing offered some of the best pay packages in the market.

> *Rossing has a lucrative package and who can say no to that. I was actually asked by my foreman to come back and train others and I came back because other offers could not match Rossing (Interview with a worker, 30 July).*

The granting of uranium licenses in Africa is sometimes viewed as a way to create more jobs and contributing to the Gross Domestic Product (GDP) through revenues for government. This leads to a situation where the number of jobs are more valued while the devastating health concerns that might potentially accompany those jobs are not discussed. It also contributes to a situation where proposed mining activities are poorly regulated. As a result,

discussions regarding safety and security of workers and surrounding communities barely form part of the major deals that government signs with potential investors. In some cases, exploration takes place in areas where mining should not be allowed in the first place due to lack of systematic social, economic and environmental impact assessments.

5.2. Safety at Rossing

Workers were able to compare the safety standards at Rossing now and in the 1970s when the company started operations. The majority who started work in the 1970s confirmed that safety at Rossing was not good. However, they said that over the years the safety has improved greatly.

> *I started in 1977 as a sample boy. This means if they want to take samples that they are testing, I must show them the place to pack it so that they do not pack at the wrong places. But health and safety was very weak because we were not told that there is more risk in this place and if you do not wash your hands, or if you stay working here for a long time or anything you do in this place is risky. All those things we were not told at all. Those days we wore overalls; it was not waterproof then quickly worn off. That is when they started acid proof overalls because that other one if you wear it for two weeks it becomes very old even the water can go through it. The Acids used to burn us through those blue overalls (Interview with Rossing worker, 30 July).*

Workers who started work at Rossing in the later found better protective measures in place, as captured in the extracts below:

> *For the kind of work I do, we wear two two-piece overalls, t-shirt, socks, safety boots, ear plucks for ear protection, safety glasses. In case when we go to areas where it is dusty, we wear dust mask (Interview with a Rossing worker, July 31).*

> *…different areas require different protective clothing. If you are going to the open-pit you will need an additional dust mask. Other safety clothing includes safety helmets, gloves, glasses and shoes (Interview with a Rossing worker, July 31).*

There were several accidents. In terms of the mining health and safety regulations, there are categories of accidents and incidents. There are 'reportable accidents, incidents and fatalities that must be reported within a specified period of time. All these must be reported to be investigated. The Ministry of Mines also investigates reported accidents:

> *We do our internal investigations at the mines but our inspector of mines must also investigate the accident upon which he must submit a report to the prosecutor general for decision whether to prosecute or not. This happens when a fatal accident happens at a mine.*

There are clear standard guidelines as to what type of accidents must be reported to the ministry. Spillages are reportable. Even when someone is working up a building and drops a tool down injuring a person than the incident must be reported. This is not a very serious accident though and when they are reported and investigated sometimes the mine takes remedial actions.

Workers also mentioned that safety standards and procedures were of satisfactory at Rossing. They however wished that more efforts would be put to protect the health of workers. Many indicated that they now know how to protect themselves against inhalation of dust and other residues of mining activities. In essence workers know of the existence of the health and safety policies of Rossing, but most do not know nor do they understand the content. In fact most of the workers who were knowledgeable about the health and safety policy were the shop stewards. The following extracts from conversations with workers are a reflection that workers do not know much about the content of the health and safety policies:

> *…nobody really seems to now especially the workers at the mine who does the basic work the content of the policy. You hear a lot about safety issues but very little about the health part. I believe that these things should be explained and made clear to all*

the workers when workers take up employment. But when they have not been made clear to me, maybe I will pick it up through the years by myself. All you hear about is wear your safety shoes do this and its all about safety and the company but very little about the workers health (Interview with worker, 29 July).

Look when it comes to health and safety as we have been at shop steward training it is only for injuries but not the content of occupational disease or what the uranium content is all about (Interview with mine worker, July 31).

There is a health and safety committee at work, but I only heard about the policy when I become part and parcel of the union. There are numerous policies but these numerous policies are not explained to the workers. The union does a lot of work in educating the members about the policies. From the company side their interest always comes first and then the workers interest second (interview with worker, 31 July).

I have a copy of the policy but it is mainly concentrating on safety; what you have to do to be protected' (Interview with worker, 30 July).

5.3. Health matters at Rossing

…I was never made aware by the company of the dangers associated with uranium mining. We only had the safety induction courses where were we are told how to work safely and wear the protective clothing. I was never made aware of the health risks involved in terms of the possible deterioration in my health (Interview with Rossing worker, 30 July).

…A lot of people are complaining of TB and I don't know if the TB is caused by the dusty environment. The white cars in the plant turn into a yellowish colour after some time. If the cars turn yellowish what about the people who are working there every day, what does it do their health? … Even if we do question these types of things; we don't get satisfactory answers from management (Uranium mine workers, Namibia).

The majority of workers emphasized that they were exposed to dust daily. This is supported by research in other parts of the world. For instance, a research organization Profundo in the Netherlands concluded: *'collectively, all uranium miners suffer the highest radiation doses of all workers in the nuclear fuel chain (apart from accident cleanup crews)' (Profund, 2008: 9).* Workers at Rossing expressed mixed feelings. Those who were working in more dusty parts of the mine were for obviously more concerned than those who were working in less dusty sections. For instance one worker commented:

I see a difference in my health especially in my chest I have a problem. Especially in the open pit you are exposed to too much dust. I work in the open pit for most of my

day (8am to 4pm) this place is full of dust. Sometimes you don't see the dust but you are exposed to it (Interview with worker, 29 July).

Workers concerns about health are not a new phenomenon at Rossing. Concerns were raised in 1992 in a publication by Greg Dropkin and David Clark. In that publication, a former Rossing worker, Arthur Pickering was asked about his experiences as a Rossing worker. The words Mr. Pickering could be regarded as an embodiment of what is happening to workers at the moment.

> *…I started in June 1978 and by November and December I had developed a chest (sic). I was coughing a great deal and I went to the medical officer at the place they have at the mine. I went there on several occasions for a X-ray's and once they actually said that I had a spot on my lung. There was a possibility of TB. Then I moved in December from the E camp, where I live, to Tamariskia and this condition continued. But eventually I went to a medical practioner there and he prescribed something and the condition improved a bit. But I think it will affect especially the black workers, and eventually I think all the workers (Dropkin and Clark, 1992: 4).*

[Here: A picture of the medical centre at Rossing]

The government and the company reacted to Dropkin and Clark's report by seeking assistance from the International Atomic Energy Agency. The team of experts admitted that there were some grievances lodged by workers regarding illnesses. *'Grievances exist about some cases of illnesses, including lung cancer, which is thought to be related to occupational radiation exposure. However, such cases can only be addressed in comparison to national vital statistics, which do not seem to exist in Namibia at the present moment'(Report of the IAEA technical co-operation mission, 1992: 12).* We agree that a nation wide comparison is vital. However, workers criticized the approach used by the team of experts.

> *The experts who came in had too little time. We feel they did not do it well. They were to come in with their own equipments, but instead they relied heavily on the company data to compile their own report. On that basis workers rejected the report of the International Atomic Energy Agency. I was full-time shop steward and I was with them all the time. I kept telling them they are not going about it the right way. They never collected dust. They just took company data. They did not interview workers. They did not interview me as a full-time shop steward representing workers (Interview with former Rossing full-time shop steward, 23 September).*

Mine workers themselves, and other people in the surrounding communities inhale dust and radon gas. The radon gas exposes alpha radiation in the body, which is destructive. Most often uranium mining is associated with cancer;

however it can do much more. Low level radiation can also contribute to birth defects, high infant mortality and chronic lung, eye, skin and reproductive illnesses (Profundo, 2008: 9). Many workers appreciate the annual health checks, but they believe conducting the test is not good enough:

> *Yes, there is a test but we have problem with it. You enter you get your pre test, you get your exist medical test. In our experience most people who go through the medical examination for exist only to hear after two or three months later that they have been detected in the advanced stage. We are questioning the credibility of the test (Interview with mine worker, July 31).*

> *Yes, we have annual health check-ups. When I started working for Rossing I went for the health check-up and I blew the pipe that they used to test the lungs or chest and the test was very good. This year when I went I had to struggle a bit to blow that thing. I was told to blow harder and harder but I couldn't. Then I started questioning how is it possible for me to blow the same as when I started years before. What I concluded is that they are trying to take the best output that you have which is not right…… here you are struggling to blow which is not a true reflection of my health state.*

He continued:

> *After the test, I believe it should be standard procedure for me to be called in and to be told that this is where you were last year and this is were you are in terms of your health and also to be told that this is getting too much in case of dust exposure. Let's try to do this or that but this does not happen. I have never heard of anything like that, after my test I was never called in. If they don't call me in, then I should believe that I am fine. In most cases the results do not come and that is the problem for several people. When they go to have test done independently outside they are found to have serious problems. Now I don't understand how these serious problems could not be detected by the mine and are detected by independent doctors (outside) if you are going for annual health check-up (Interview with a worker, 30 July).*

> *…the first time when they employed me they shared the results with me. Thereafter we have to do annual health test, these results are not discussed. You only go for a check-up and afterwards you are told you are fit to work for another 12 months. There is no time where you are shown your results for that year compared to the previous year. I think they do their own evaluations behind close doors and declare to you that you are fit to work. They also do HIV/AIDS test on request and I had requested one. I hand*

to go back to ask for my results but the question is what if I did not go back would they have called me in? (Interview with a worker, 29 July).

The union is hoping that the company and the workers design a policy to look after the people who have developed occupational health diseases. They expect at least a long-term reparation plan for occupational health problems.

What is radiation, radiation is not something that you can protect yourself from with clothing. Radiation is a mix of radio active you cannot see it. They can say they measure it but you cannot see it (Interview with union representative, July 31).

The union representative at Rossing pleaded:

First of all what we want is to make a policy, a policy of after care. If a person has been detected with an occupational disease how should he be cared for from the company side and if at all there is compensation what type of compensation should it be? Presently we do not have a policy on how to compensate people who have occupational diseases, the policy that we are having is only for disability (Interview with the union representative, July 31).

Workers were worried about the fact that some of their colleagues (current and former) are suffering from cancer. Workers want to understand the possible health implications that can be picked up if they are working in a uranium mine. Consider the view of the union representative below:

From the union point of view, we are asking why people who were working here are having cancer. And that is the dispute. What is the cause of cancer? You go for annual checks but it is only that if people go for medical testing at outside doctors. They are claiming that they are sick but the doctors here say that you are fine. Only outside doctors that detect cancer not the Rossing doctors or not even those that Rossing refer us to (Interview with a union representative, July 31).

The mine workers union has records of names of workers who have complained about health problems. The dilemma is that the company is expecting further scientific proof that these people who are sick due to exposure to radiation. The union representative said:

There are reported cases where the people have complained and they are still complaining. Their names are there and even Rossing knows about these people. Rossing needs proof that the company affected them. Now us as workers cannot prove it. As from 2000 until today he (Petrus Gaeb) is on sick leave just because the company says give proof. How can we give proof? What was reported by Dr Zaire is crucial information, which nobody wants to come forward to say if it is true. Even the occupational

health and safety is only touching these injuries but never touched on radiation.

In the end worker's health may be sacrificed in pursuits of the profits that mining companies promises the host governments through tax revenues. For workers, due to the increasing unemployment rates (currently just below 40 % in Namibia), job opportunities at the mines becomes more important than their own health. A worker explained: '*…we keep the job as a security measure, your heart is telling you to work but your mind is telling you to go (Interview with a mine worker, 31 July).*

It is disturbing that workers no longer trust the company doctors. Some have opted to consult other private doctors. Some workers said they even avoid consulting the doctors that the company doctors recommend to them. The following quote highlights the concerns:

…I consult private doctors annually to keep track of my health status because I don't trust the mine doctor. …It's only when workers have left Rossing; gone to private doctors that they are told the true reflection of their health status in terms of illnesses which means the mine doctor is gambling with the health of the workers and manipulating their files (Interview with mine worker, 30 July).

Workers also started querying the link between exposure to radiation and diseases such as respiratory problems such as Tuberculosis (TB) and cancer. Workers claim that the some of their colleagues complain about TB. Others have died from cancer related diseases. This is despite the fact that for many years they were given a clean bill of health. Workers are therefore starting to query the validity of the annual health check ups. They are always told they are healthy when in actual fact they do not feel healthy. The extract from a conversation with a Rossing worker makes the point:

There are numerous risks involved especially the dusty environment we operate in. A lot of people have been coughing and have TB. A lot of people are complaining of TB and I don't know if the TB is caused by the dusty environment. When you come into the plant there is a smell that you don't know what it is and you start questioning yourself as to what it is. The white cars in the plant turn into a yellowish colour after some time. If the cars turn yellowish what about the people who are working there every day? what does it do their health? These are the type of things we are not told about by the company. Even if we do question these types of things; we don't get satisfactory answers from management (Interview with a Rossing worker, 30 July).

Workers also realised that the effects of exposure to radiation in a uranium mine take a long time to become visible. This is because some of their colleagues were declared healthy and 'fit to work' for many years, however, just before retirement

some health problem such as cancer or TB was detected. Thereafter, they die within six months after being laid off on 'disability'. Mine workers are constantly exposed to low-level radioactive pollutants. To determine the risks resulting from their exposure, doses of radiation have to be calculated carefully. Conditions for the mine workers must be vigorously safeguarded. Some workers are calling for extra clauses in government regulation:

> *… All of us are here for the bread but if the government knew really the consequences of uranium they should have put some measurement in place such as the law that a person must not work more than twenty years in the uranium mine (Interview with mine worker, July 31).*

Workers also say that often when the company realizes that a worker is exposed to too much radiation, the worker will be shifted from that particular position. This strategy is to reduce radiation levels. The workers appreciate this process of being shifted, but they were often not told the truth. The following remark was common:

> *…They won't tell you that you are being shifted due to your radiation levels they will come up with an excuse. Some of the reasons used are that it's cross training and staff development. They never shift you back to your original department because they know your health capacity and don't want to run risks.*

We believe that it is vital to not capitalize on the workers lack of knowledge about the possible link between exposure to radiation and health effects. The union has started to raise the issue of exposure with management. The union has also started to strive towards making workers aware of the dangers associated with exposure to radiation. Many workers feel that this might be already too late as some of them could be sick.

During uranium mining operations workers are exposed to low-level radiation, which will not have an immediate effect on their health. Effects will only be observed after many years, sometimes one or two decades after exposure. It is almost impossible to relate the delayed impact of the health of the workers to previous work in a uranium mine and to obtain legal proof in order to receive compensation. Workers' health must be monitored over a long period of time even after they stopped working for the mine. One worker explained his symptoms as follow:

> *I began suffering from high blood pressure. I became weak. I could not walk. I was confined to a wheelchair at some stage. The wheelchair is still at my house. The doctor gave me some vitamins and now I am a bit better. My legs are still very weak and sometimes I risk falling when I try to walk.*

The manager of external affairs at Rossing maintained that the annual health checks conducted by the company are credible. Through the health checks, the company claims to trace the health conditions of their workers and therefore *'the company cannot take responsibility if a person gets sick after leaving the employment of Rossing, because regular annual health checks are performed'*. Workers are nevertheless claiming that many times, their colleagues are laid off when the company knows they are sick. This is how strongly one worker stated it:

> *When you are 55 years the company will force you to go on early retirement. This is not a direct force and therefore the union is also involved. But you don't know that you are sick only the company knows. At that age they go through your medical records and assess your health status if your health status has been deteriorating then only do they approach you with early retirement options. A couple of months later when the people leave you hear that the person was diagnosed with cancer by a different doctor.*

He concluded

> *. 'I have not heard of any one who has worked for this mine for more than 20 years who is still in good health'.*

The open-pit mining contributes to increased levels of dust containing radioactive particles reaching the coastal area. At the moment the impact on the people's health and the environment is not known. The company believes that at Rossing the nature of exposure to radiation is of low level. Dr. Swiggers of the Chamber of Mines told us that radiation at Rossing is below 1 millisievert a year. *'In fact, at Rossing we have decided that it should even be lower than twenty'*.Dr. Swieggers points to an internationally accepted standard. He also argues that this level of exposure is lower than normal radiation that a person can be exposed to when in other parts of Namibia, such as Windhoek or when on a plane.The reality is that Windhoek does not have a uranium mine and most of us do not spent a lot of time on the plane. A well known researcher on radiation Dr. John Gofman once responded to the question of radiation and flying and he argued:

> *Radiation exposure, from natural cosmic sources increases with altitude, with peak dose at 45,000 feet. Dose from cosmic radiation also varies with latitude; it is lowest near the equator and highest near the poles. Therefore, the extra radiation dose from flying depends on (a) the particular route (b) the duration of the flight and (c) the fraction of the trip spent below the flight's maximum altitude (http://www.ratical-org/radiation on 18 July 2008).* Dr. Gofman also argued that there is no level of radiation that is safe. In this regard he pointed out that:

> *Safe means free from danger or risk. Safer means more nearly free from risk than something else. Safest means the most nearly free from risk than other things under discussion. Even the safest car is not safe (risk free), with respect to cancer and*

inherited afflictions. In other words, there is no 'threshold' dose level below which all cancer risk from radiation disappears (http://www.ratical-org/radiation on 18 July 2008).

During a presentation in 1994 entitled 'health and safety implications of nuclear development, Bertell argued that: 'There is no such thing as a safe dose of radiation. It is known that radiation kills, maims, causes mutations, is cumulative, causes leukaemia, cancer, respiratory illnesses and attacks the immune system. In addition Wunsch wrote:

…evidence now suggests that there is no such thing as a harmless dose of radiation….Recent experiments indicate that low levels of radiation may not only cause diseases than previously thought, but that this damage maybe genetic and show up only in future generations. This means millions of people now and in the future are potentially at risk from radiation exposure considered safe under current levels (Wunsch, 1997).

While Rossing and the Chamber of Mines have accepted these minimum levels of radiation, we should not sit back and allow thousands of Namibians to be exposed when the long-term effects of such exposure is yet under researched. The reality is that there is a need to acknowledge that many workers at uranium mines spent a lot of their working time exposed and at risk. We believe that exposure to radiation even of low levels can be damaging. This is because it has been proven that exposure to low level radiation can be a contributing factor to hereditary diseases, cancer, pre-mature aging, weakened immune system as well as damage to fetuses.

…if you develop any health problems the annual medical check up will pick it up, but sometimes it is difficult because you may think that you are fine because the radiation is like cancer you will not see it with your eyes but if you have health problems they can pick up at the medical check up annually. … if you look in the history there were guys who will go on leave for a month and after a month or two then he will die of cancer which means there are really questions regarding the medical check up we do annually whether they reflect the truth of what is happening in your body? (Interview with mine worker, 30 July).

The results of the tests are not really shared with you. Sometimes you are told that your lungs are giving in; and then the doctor tells you to stop smoking but the other details you are not told if you don't ask. If there is anything else wrong with you they keep it as a secret unless it's something physical that you can observe yourself. In the long run you just keep on working. For example when one gentleman went for the final health check-up he was told he has stomach cancer. And we were wondering now that how they could not have detected it a long time ago if the gentleman goes for a health check-up every year. He was of retirement age and he had to go, there was no way they could keep him. That gentleman went back to the

north. I don't know how he is doing currently. There is no law to protect workers who are in such situations (Interview with worker, 30 July).

It is very difficult for us to scientifically confirm these experiences and views. However, the fact that many of the workers made reference to respiratory problems is worrying. We believe that workers have genuine concerns. It is possible that there are specific radiation linked health clusters in Arandis and surrounding towns such as Swakopmund and Walvisbay. This also means that there are many people in these towns who are at risk of diseases caused by radiation. These concerns need elaborate investigation-which includes independent experts. During our conversations with workers, we noticed that many are beginning to suspect that some of the general health problems they experience in Arandis might be due to extended exposure to low radiation. For instance one worker commented:

Many of the children in Arandis's eyes are always red. There are also many children in Arandis who are having asmath pumps. Another problem we have in Arandis is allergies. Even our wives who have never worked on the mine suffer from allergies like some mine workers. How does one explain that?

It is also possible that the life-expectancy is much lower in these towns compared other parts of the country. Our fear is therefore not just for the current and former workers. We are concerned about the residents of the towns in the nearby vicinity.

We therefore need long-term studies to determine how much radiation former, current and residents of Arandis are exposed to, what type of diseases they developed and what the risks are of low level, but extended exposure to radiation. In areas such as Chernobyl in Russia, long-term studies found that people died of leukemia years after exposure. Other health problems such as thyroid and breast cancer as well as urinary tract problems were only noted 15 years later.

We have learned that uranium tailings contain a variety of contaminants that have to be safely contained to avoid environmental hazards. Due to the process of mechanical milling, the material is no longer rock-like but becomes more sand-like, thus becoming susceptible for dispersion into the environment, e.g. by wind, and enhances the release of radon gas. Since the milling process only extracts the uranium from the ore, all radioactive decay products that were associated with the uranium remain in the tailings. Among these are long-lived radio-nuclides such as thorium-230 (80 000 years half life) and radium-226 (1 600 years half life). The latter is of specific concern, since it continuously decays to radon-222, which has quite a short half life of 3.8 days, but as a gas can easily escape from the tailings deposit. In the surroundings, radon presents a lung-cancer hazard when inhaled.

The workers who are already sick simply want to see companies such as Rossing accepting the fact that they played a role in their ill-health. They would like to see the future of their children taken care off, since they believe they will not be there to see their children growing up. These were words of a worker who was laid off due to disability:

> *Rossing should give packages to those of us who are laid off due to disability or ill health. I just need money to secure the future of my wife and children. I have three children; two of them are in school. At the moment I am always stressed because of money. Sometimes I am forced to go to cash loans to solve my financial problems. I explain to Rossing all the time and the company does not want to listen. The company has money and we do not have (Interview with Rossing 29 July).*

5.4. The wishes of workers

Most workers are not against investment through uranium mining. They are not anti development, nor do they want to see themselves and their loved ones languishing in poverty. Many expressed delight with the prospects of a number of investments projects taking place in Erongo. They believe it will bring needed development to their region, but most importantly it is a form of job security for them and their families and eventually the spill off effects will be felt country wide. However, investors should put the health of workers and their families first if they want to optimally utilise their needed skills. This is especially crucial if Namibia is to become one of the top uranium producers in the world. All eyes will be on Namibia, because an evaluation of a country's performance can be judged on how a country treats the most vulnerable.

Workers want to be able to make informed decisions. They believe the companies know the truth about the dangers associated with uranium mining, but they do not share that because they are afraid to that workers might seek compensation or will not take up employment. The reality is that many will not have a choice but to work for the uranium mines given the lack of other job opportunities. They are therefore calling for more honesty and transparency from the companies when engaging with them on issues of radiation. A few would have probably declined the job offers, if they had knowledge. But it is important that it would have been an outcome based on an informed decision:

> *If they had told me about the dangers of working for a uranium mine, I would not have taken up employment with them. Now I hear about a lot of things, radiation and people getting sick. I am also starting to question how long I will be here but I will have to start looking for other employment. I am already looking at other employment opportunities currently. Many things are hidden from you, you are only told about the good things and the salary is good. At the end of the day you sit there retired and sick and don't have anything else (Interview with a worker, 30 July).*

If I knew about the dangers, I would not have taken chances and taken up employment with Rossing. For Rossing to tell us they would be scaring workers away for employment. For Rossing not to tell us is to their benefit for us to come and make production for them and for them to get lots of money (Interview with a worker, 29 July).

Workers do not have the resources to proof that their health problems are linked to their occupations. They argue that it is for that reason that the company is not worried about their claims. It is important for the company to accept the fact that radiation might only take effect after many years of exposure. The company should therefore look after their workers even a couple years later after they have left the employment of the company. That will be based on the assumption that the company care about their current, former and future workers. For now, this remains to be seen.

7. Conclusion

Uranium mining is different from other minerals that are extracted from the ground. Its mining is associated with a number of health and environmental problems. As a waste product, uranium mining generates huge amounts of so called tailings. Most of what is mined contains little uranium. Therefore in order to get to the real uranium, large amounts of ore have to be milled and processed. These tailings can have negative implications by means of seepage of uranium which is not extracted from the ore and chemicals into the groundwater and through dust dispersion, if not covered properly.

The mining of uranium is usually accompanied by bi-products of radio-nuclides of the uranium decay chain such as radium, radon, thorium and others. Radon gas, a radioactive daughter product of radium, is a threat to the health of people, especially workers and those living close to the mines. When inhaled, the gas can cause lung cancer and other forms of lung diseases. The mining of uranium should therefore be of concern not only to those who directly work with it (the mine workers), but also for the surrounding communities.

Although the mine owners continue to deny the health risks associated with uranium mining, workers at mines are ever exposed to low level radiation doses. The negative impact on worker's health is often evident only after many years or even decades of exposure, which makes is extremely difficult to prove the real source of the ill health. They are exposed to contaminated dust and radon gas which they consequently inhale. Once the body is exposed over a longer period, it may be harmed for good. Contamination is not only felt at the mining site itself, people in the surrounding communities are also affected. Many times the health effects are linked to cancer; however other types of health problems such as birth

defects, an increase in infant mortality and chronic lung, eye, skin and reproductive illnesses are also compounded by the exposure to uranium radiation.

In Namibia general knowledge and awareness about the nuclear industry and its complex of impact on humans and the environment is negligible. In order to make use of their democratic rights and influence development towards sustainability, citizens need to understand issues and problems related to the nuclear industry. Earthlife Namibia has started taking the lead in filling this gap through education and awareness drives, targeting the general public. However, this activity needs to be intensified. The public campaigns are not meant to discredit any stakeholder, but to find ways to achieve the best possible practices for uranium mining.

Large projects are often accompanied by changes on the socio-economic conditions of a community. The increase in uranium mining projects will certainly lead to more employment opportunities. Given the current levels of unemployment in Namibia, there will be potential inflow of migrants from other parts of the country. Some migrants might even come from other countries. At the moment the mining companies rely on foreign experts such as geologist to carry out core mining activities due to a lack of such skills in Namibia. The pressure on social facilities and services such as housing, schools, and hospitals will be enormous. It is therefore important that the regional councils expect the companies to assist in setting and improving the existing infrastructures as part of the conditions for investment.

We understand that mining contributes significantly to GDP. But to what extent do the communities around the mining areas benefit from their own resources? We need to find a win-win situation for both mining companies and communities. We need to find ways in which our natural resources can be beneficial to the workers and the surrounding communities. The government, the mining companies and various stakeholders need to reconvene meetings to discuss issues of socio-economic development.

In terms of legislation, indications are that Namibia is doing fairly well. The expected law on uranium mining is a progressive step. It is therefore important that the new legislation also put emphasis on monitoring compliance, which is inadequate at present. Companies took advantage of the absence of a coherent law. Mr. Shivolo's words were indeed telling in this regard:

> *…I remember one of my staff was chased at Stone Africa because by law we did not have any power. With the law we can enter anytime we prefer. We can issue order, the legislation will empower us to employ environmental officers who will actually monitor compliance, if the owner resists then the officer is empowered to go to the police. It is a powerful legislation which was not there before. Now we are equipped you cannot just come and open a factory, which is an in environmentally*

sensitive area you are compelled to do an EIA study because we would like to have a clean production (Interview with Mr. Shivolo, Director of Mines, 27 August).

Due to the energy crisis, some countries including Namibia have started placing nuclear energy on their agendas. However, Namibia is a country blessed with enough sources of renewable energy. There is enough prospect for solar and wind power. Nuclear power plant should therefore be the last option: David Fig recently advised:

…going nuclear would not be in Namibia's best interests. Given other more viable options, the nuclear path would entail massive expenditure, filling the deficit of highly-skilled operators, the need to set up a regulatory apparatus, the need for a nuclear waste management system, and the costs of decommissioning in the future. Not including the risk, the costs of such an enterprise would include relying on expensive outside expertise and burden the Namibian treasury and taxpayers for many years to come (2008: 19).

Mining has short-term benefits, but long-term consequences. The negative effect on the health of the community is sometimes more subtle and unexpected. Namibia therefore needs a clear strategy to evaluate the sustainability, ethics and responsibility of external investment in the extractive sectors. With the support of civil society and the community, the government can develop the capacity to design such strategies.

8. List of references

Bank of Namibia (BON). 2007. *Annual report.* Bank of Namibia, Windhoek.

Bank of Namibia (BON). 2008. *Quarterly bulletin.* Bank of Namibia, Windhoek.

Bertell, R., *Health and Safety Implications of Nuclear Development*, South Africa Conference 1994).

Commonwealth Secretariat, 2007. 'Technical assistance on uranium mining in Namibia'. Accessed from; http://www.thecommonwealth.org/news. accessed 19 July 2008.

Fig, D. 2008. 'Governance and radioactivity: managing Namibia's uranium Resources'. *Southern Africa Resource Watch.*

Fig, David. 2005a. *Uranium Road: Questioning South Africa's Nuclear Direction.* Johannesburg: Jacana.

Dentlinger, Lindsay. 2006. 'Namibia Considers Nuclear Power Option'. The Namibian, 31 January.

Dropkin, Greg and David Clark. 1992. *Past Exposure: Revealing Health and Environmental Risks of Rössing Uranium.* London: Namibia Support Committee.

Government of the Republic of Namibia (GRN). 2002. 'Minerals Policy of Namibia'. Ministry of Mines and Energy'. Windhoek

Government of the Republic of Namibia. 1990. *The Constitution of the Republic of Namibia. Government of Namibia.*

Government of the Republic of Namibia. Environmental assessment policy.

Government of the Republic of Namibia. 1999. *Policy for Prospecting and Mining in Protected Areas and National Monument.*

Government of the Republic of Namibia. 2008. *Namibia: a review of Namibian trade and industry: Trade directory 2008.* Ministry of Trade and Industry, Windhoek.

Hartman, A. 2008. 'Namwater's grand desalination plans'. The Namibian, 13 August.

International Atomic Energy Agency (IAEA), 1992. *'Report of the IAEA technical co-operation mission to Namibia on the assessment of radiation safety at Rossing Uranium mine'*. IAEA.

Profundo, 2008. 'Mined U-financing of new uranium mines'. Profundo.

The Namibian, 2008. 'Uranium stewardship committee established'. March 3.

The Namibian, 2008. 'Battle for uranium resource hots up'. September 3.

The Namibian, 2008. 'Mining conference in Perth Paladin on track with growth in Namibia's uranium mining'. September, 8.

Tjaronda, W. 2007. 'Mining still number one' .New Era, April 24, 2007.

Tjatindi, C. 2008. 'Namibia: development of uranium mines puts 'strain' on country water supply'. *New Era*, 1 September.

Stablum, A. 'Lack of power and water caps Namibia's uranium production'. The Namibian, September 10.

Weidlich, B. 2008. 'Government plans to set up nuclear reactor'. March 3.

Weidlich, B. 2007. 'All eyes on uranium mining in Namibia'. *The Namibia*, 11 May.

Weidlich, B. 2008. 'Govt grants 25-year uranium license to Canada's Forsys'. August 27.

Weidlich, B. 2008. 'Nuclear giants target Namibia as their playground as companies line to the prospect and exploit Namibia's rich uranium endowment, the green lobby warns of detrimental effect to the ecology'. September, 12.

http://www.mbendi.co.za/indy/ming/urnm/af/na/p0005.htm. Accessed 23 September.

Kaira, C. 2008. 'Cement becomes gold as uranium mines take shape'. *Namibia Economist*, July 18.

DATA COLLECTION INSTRUMENTS
URANIUM MINING IN NAMIBIA
LaRRI 2008

1. INTERVIEW GUIDE: MINISTRY OF MINES

Date:
Location:

1. When was the first license for uranium issued in Namibia?
2. How many licenses have been issued in the last 5 years?
3. In which (specific) locations are licenses being issued and why?
4. What is the profile of a typical prospecting license applicant?
5. Which countries do most of the applicants come from?
6. Under what conditions are prospecting licenses issued?
7. Under what conditions are they rejected?
8. After the license is issued, what is the next procedure?
9. What checks and balances are in place to ensure that mines adhere to EIA?
10. Can you shed more light on the type of contracts entered between the ministry and the uranium companies?
11. How often does mine inspectors visits the mines?
12. What kinds of accidents have been reported to happen on the mines?
13. How often does the Ministry receive reports about accidents on the mines?
14. What action is taken by the ministry when an accident happens?
15. Where does Namibia's uranium generally get exported to?
16. How much uranium is exported per year?
17. Under what conditions does the Ministry grant ground water permit?
18. Do all mines require these permits?
19. When do you expect to start enforcing the new law on uranium mining?
20. Why did the Ministry see the need to have a new law on uranium mining?
21. Which stakeholders gave input on the new law?

2. INTERVIEW GUIDE: MINISTRY OF TRADE AND INDUSTRY

Location:
Date:

1. How many uranium companies are registered with the Ministry of trade and industry?
2. Who are the owners?
3. Where are they operating from?

3. INTERVIEW GUIDE: MINISTRY OF ENVIRONMENT & TOURISM

Date:
Location:

1. What environmental policies do you have in place?
2. Do you conduct any sampling tests around uranium mines?
3. Have you ever received complaints from communities around the mines regarding effect of uranium mining in their areas?
4. Are there any reported cases of ground water contamination by the uranium mines?
5. What have you done about it?
6. How often do your inspectors go around the mining sites to identify any damages caused to the environment?

4. INTERVIEW GUIDE: MINE MANAGERS

Name of company:
Date:
Location:

1. Background of the company(year established, board members, ownership, membership of association)
2. How many workers do you employ including expatriates?
3. In which categories? (gender breakdown, permanent workers, contract)
4. Does the company make use of sub contractors? If so, for which operations and why?
5. What are the main activities that take place at the mine?
6. Has the company conducted an EIA before starting operations?
7. What were the main findings?
8. Where the findings disseminated? If so, to whom and what was the response?
9. Does the company have a health and safety policy? Can we have a copy?
10. Does the company have a health and safety committee? Who are the members?
11. Have you had any accidents /injuries on the mine so far?
12. What was the cause of the accident(s)?
13. What could have been done to avoid them?
14. Does the mine make provision for pre and post health check-ups?
15. How often are health check-up's conducted?
16. Does the mine provide protective clothing for the workers?
17. Does your office receive health related complaints from workers/retired/previous workers in that they may have picked up while working at the mine?
18. On average how much uranium do you mine per year?
19. Where is most of the uranium exported to? Why those countries?

20. What are the dangers associated with uranium in general?
21. How do you dispose of your end product (tailings)?
22. What measures are in place to safeguard the environment?
23. What do you envisage the life span of the mine to be?
24. What measures are in place once the mine has reached its life span?

5. INTERVIEW GUIDE: SHOP STEWARDS
DATE:
PLACE:

1. When did you start work at the mine?
2. Which union organizes at this mine?
3. Do you know if the mine conducted an EIA study before starting operations?
4. Were the results shared with the workers?
5. Does the mine have a health & safety policy?
6. Do you know the content of the health and safety policy?
7. Does the mine make provision for pre and post health check-ups?
8. How often is health check-ups conducted?
9. Have you had any accidents /injuries on the mine so far?
10. What were the causes of the accident(s)?
11. What could have been done to avoid them?
12. Does the mine provide protective clothing for the workers?
13. Does your office receive health related complaints from workers/retired/previous workers that they may have picked up while working at the mine?
14. On average how much uranium do you mine per year?
15. Where is most of the uranium exported to? Why those countries?
16. How does the mine dispose the end product (tailings)?
17. What measures are in place to safeguard the environment?
18. What do you envisage the life span of the mine to be?
19. What measures are in place once the mine has reached its life span?
20. What problems do workers face at this mine?
21. Are workers generally made aware of the dangers associated with uranium mining?
22. What would you want to see changing at the mine?

6. INTERVIEW GUIDE: CURRENT WORKERS
Location:
Date:

1. How long have you been working at the mine?
2. What kind of work do you do?
3. Do you wear protective clothing? (What kind?)
4. Where you made aware of the dangers associated with uranium mining before taking up employment?
5. What do you think are the risks associated with the kind of work you do?
6. Were your required to take a pre health test before taking up employment?
7. Does the company send you for health tests? How often?

8. Does the mine have a health and safety (H&S) policy?
9. What is the content of the H&S policy?
10. Do you have a health and safety committee at the mine?
11. Do workers form part of the committee? (Mention members)
12. What issues are discussed by the committee?
13. Did you develop any health related problems since you started work at the mine?

7. INTERVIEW GUIDE: FORMER WORKERS
Date:
Location:

1. Name
2. Age
3. Sex
4. Which mine did you work for?
5. How long did you work for the mine?
6. What duties did you carry out at the mine?
7. When did you leave the mine?
8. Why did you leave the mine?
9. What health problems did you experience while working for the mine?
10. Did you go for a pre and post health check up?
11. If yes, what were the results? (both pre and post)
12. What happened after you left the mine?
13. Would you have worked at the mine if you knew the health implications of working there?