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Study on low-level radiation of Rio Tinto's Rössing Uranium mine workers

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Summary

The study is based on 44 questionnaires carried out with workers and ex-workers of Rössing. Two questionnaires were designed, one for former and one for current mineworkers. 12 respondents are former workers and 32 are still employed with Rössing.

A previous study done by LaRRI in 2009 focused on the general working conditions whereas this study attempts to establish a connection between occupational exposure to low level radiation and chemicals, and the health condition of workers.

Rössing has improved safety and health policies during the years of operation. When Rössing started production of uranium in 1976, no safety and health policies were in place. According to the statements of the workers, currently safety measures are high; the workers are trained on a regular basis and undergo refresher courses once a year. Despite this, some workers still confuse dust with radiation and believe wearing protective equipment protects them from radiation. In fact, protective equipment limits exposure (for example limiting dust inhalation) but does not protect workers from external irradiation by gamma radiation.

Almost all workers (39) have complained of health problems. Many workers complained about the tough working conditions causing them back pain, breathing, hearing and visual problems. Most of those are operators of heavy equipment. The biggest trouble however is said to be the constant exposure to dust. Two current workers are on sick leave since 2000 and 2003 respectively. One worked as laboratory technician for 24 years and has proof that he was contaminated. The other was open pit operator for 19 years. His health problem is unknown to us.

Most workers stated they are not informed about their health conditions and generally don't know whether they have been exposed to radiation or not. Some workers consult a private doctor to get a second opinion, that is however a measure that most workers cannot afford.

It raises questions that none of the respondents was ever diagnosed with a specific illness, except one current worker; he is 61 years old and works for Rössing as a lab technician since 1990. He stated:

“Yes. I have cancer now. In the beginning the mine didn't want to give me money for the treatment but later when they referred me to a doctor in Windhoek for an operation they gave me money for treatment. I am healthy now.”

Only four workers said that they don't know anyone being sick because of working in the mine. These are young workers, who started work with Rössing only recently and have no contact to former and older workers. **The older workers all**



said they know miners dying of cancer and other diseases, mainly after retirement. These are workers who started working in the mine in the 70s and early 80s when safety conditions were non-existing or very poor. The questionnaires **confirm that many of these workers are by now retired and many have already died of cancer or unknown diseases:**

“People get sick. We are seeing it in people that have worked for Rössing for a long time. They just go back and die after working for Rössing”

“Yes, most of them that I know of have retired. Some of them just spent very few months and they died. They were diagnosed with a lot of sicknesses like TB, lung infections and cancer.”

“Some died and some left the work due to illness.”

“Doctors were told not to inform us with our results or tell our illness. As you know she is also just working for the company and she just has to obey to what she is told. These have become a very dangerous issue since you are sick and never informed about your sickness. They only supply you with medications until you are totally almost finished up or about to die it's when they will tell you what your sickness is. I even had a friend who died of cancer but he was never told about his results. They were supposed to tell him. It was very painful news to hear that he died of cancer while he has been going for the test and was never informed.”

Uranium mining companies generally deny that workers get sick because of exposure to radiation. They blame the bad health conditions to unhealthy lifestyle such as eating habits, tobacco smoking and alcohol. Of 44 respondents, 11 workers smoke and none of them had any serious illness. Lifestyle and drinking doesn't seem of great concern.

This study unambiguously demonstrates that the workers pay a high price for the benefit of working with the giant mining company Rio Tinto.

Most workers stated they would rather not work in Rössing uranium mine but had no other choice, they needed to earn a living and support their family, indicating the vulnerability of their position.

Main demands and recommendations are:

- Perform a large-scale epidemiology study with independent medical experts to examine those workers who started working in the 1970s or early 1980s.
 - The Ministry of Health and Social Services must get unrestricted access to all medical reports of all workers employed by Rössing.
 - Likewise all mineworkers should be able to have access to their own medical reports.
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Keywords

Uranium mining

Rio Tinto – Rössing

radiation

health impacts



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Acronyms

CSO	Civil society organizations
EC	European Communities
EIA	Environmental Impact Assessment
EJO	Environmental justice organizations
LaRRI	Labour Resource and Research Institute



Foreword

Conflicts over resource extraction or waste disposal increase in number as the world economy uses more materials and energy. Civil society organizations (CSOs) active in Environmental Justice issues focus on the link between the need for environmental security and the defence of basic human rights.

The EJOLT project (*Environmental Justice Organizations, Liabilities and Trade*, www.ejolt.org) is an FP7 Science in Society project that runs from 2011 to 2015. EJOLT brings together a consortium of 23 academic and civil society organizations across a range of fields to promote collaboration and mutual learning among stakeholders who research or use Sustainability Sciences, particularly on aspects of Ecological Distribution. One main goal is to empower environmental justice organizations (EJOs), and the communities they support that receive an unfair share of environmental burdens to defend or reclaim their rights. The overall **aim** of EJOLT is to improve policy responses to and support collaborative research on environmental conflicts through capacity building of environmental justice groups and multi-stakeholder problem solving. A key aspect is to show the links between increased metabolism of the economy (in terms of energy and materials), and resource extraction and waste disposal conflicts so as to answer the driving questions:

Which are the causes of increasing ecological distribution conflicts at different scales, and how to turn such conflicts into forces for environmental sustainability?

One of the partners of EJOLT, Earthlife Namibia had carried out several meetings with workers of the Rössing Uranium mine. It came to Earthlife's attention that many workers complained about deteriorating health condition and diseases they did not experience before working for the mine. The workers tell disturbing stories about cancer cases and early deaths which they connect to occupational exposure of radiation and dust.

In the context of the EJOLT project, Earthlife Namibia together with the Labour Resource and Research Institute (LaRRI) decided to carry out a study on the exposure to low level radiation on workers of the Rössing Uranium mine, operated by Rio Tinto since 1976.

A previous study done by LaRRI (2009) focused more on the general working conditions whereas this study attempts to establish a connection between occupational exposure to low level radiation and chemicals and the health condition of workers.



This paper serves as an update on a study of the exposure to low level radiation of the workers employed by Rössing Uranium. Uranium mining has a value addition to the national budget of Namibia, however the question arises: does the harmful effect on worker's health justify the activity? Does uranium mining happen at the expense of the life and health of the mine-workers? This project was done to better understand the complaints of the workers. The results, ideas and stories presented in this paper are real and are currently happening.

1

Introduction: Namibia in the uranium world

Namibia has a wealth of uranium deposits located mostly in the Namib Desert of the Erongo Region and was on the verge of undergoing a “uranium rush”. Exports of about 4 000 tons of uranium oxide (U_3O_8) per annum put Namibia as number five on the global uranium market in 2012. However, the nuclear accident in Fukushima in 2011 caused a severe drop in the uranium price from about US\$75/lb U_3O_8 to US\$35, putting mining companies in financial difficulties and bringing some uranium projects to a halt (Forbes, 2014)

In Namibia, uranium is mined, milled, transported and exported as yellow cake (U_3O_8) since 1976, although suitable legislation that would regulate the nuclear industry is still largely absent. Uranium mining took place under the same conditions as mining of any other mineral, in spite of the significantly different health implications. Although the safety regulations have improved considerably, it is still up to the respective mining company to comply with international standards – or not.

Uranium mining in Namibia as well as in other African countries is regarded as an opportunity for many foreign prospecting and mining companies. Environmental and social legislation in countries such as Canada and Australia became very strict, making it too cost intensive to mine uranium at home. As John Borshoff, the Managing Director of the Australian mining company Paladin Energy put it: “The Canadian and Australian have become over-sophisticated in their environmental and social concerns over uranium mining. The future of uranium is in Africa.” (Sun Herald, 2006).

Lack of legislative frameworks on the uranium industry invites foreign companies to come to Africa. Other incentives are the high unemployment rate in African countries, weak labour conditions, generally low wages and workers not properly informed about the danger they are exposed to when mining uranium.



Presently two uranium mines are operating in Namibia; Rössing Uranium by Anglo-Australian Rio Tinto and Langer Heinrich by Australian Paladin Energy. The Trekkopje mine constructed by French state-owned Areva has been mothballed and put under care and maintenance in 2013. The Husab Uranium project is currently under construction by Swakop Uranium, a company 100 per cent owned by Chinese state-owned Guandong Nuclear Power Corporation (CGNPC).

The Rössing Uranium mine alone accounts for 7% of the world uranium production which constitutes 10% of Namibia's total export (Ministry of Mines and Energy, 2012). The recent rise in demand for uranium has put Namibia on the trade spotlight among uranium consumers.



2 Rio Tinto's Rössing Uranium Mine

Rössing Uranium mine is located in the Namib Desert close to the town of Arandis, 65 km inland from Swakopmund. Rössing operates the third largest open-pit uranium mine worldwide. Being the first uranium mine in Namibia, Rössing started operation in 1976. The ore body is an enormous low-grade (100-300 ppm equals 0.01-0.03% uranium) alaskite-hosted deposit. The mine is owned 69% by Rio Tinto, a British-Australian multinational metals and mining corporation; other shareholders are the government of Namibia with 3%, the government of Iran with 15%, the Industrial Development Corporation (IDC) of South Africa with 10% and local individual shareholders with 3% (Rössing, 2009).

At the time Rio Tinto started uranium mining at Rössing, environmental and social impact assessments (ESIA) were not the order of the day. Safety measures, protection of mineworker's health, consideration of environmental impacts were absent. These conditions only changed later when mine workers complained about increased illnesses. However, safety measures are given more attention than the protection of worker's health. Today the miners still complain of deteriorating health conditions, particularly those serving Rössing for many years.

In early days of production, the black workers lived in so-called single quarters on the mine premises and were exposed to dust and radiation 24 hours a day. Only later Rössing began building houses for the workers and hence Arandis was born, about 15 km outside the mine.

During the first years of operation, Rössing operated with a migrant labour system. The International Commission of Jurists has referred to the migrant labour system as similar to slavery and declared it as unlawful. Even a representative of the South African government agreed before the International Court of Justice at the Hague, that restrictions on the African workers bar them from acquiring any suitable skills (Duggal, 1987:26).



Jumping to more recent times, in 2004, three men were arrested for the theft of about 28 kg of yellow cake. Later the police found three 500 ml bottles filled with U_3O_8 in a house in Arandis. Again, in September 2009, the amount of 170 kg of yellow cake was stolen. It was obvious that the suspects were not aware of the danger of the stolen material (The Namibian, 8 Sept 2009). These incidents clearly indicate lack of security and the worker's lack of knowledge of the impacts of uranium on their health.

Insight Magazine (April 2013) reported that Rössing Uranium retrenched 276 workers. This was part of restructuring the mine because of low demand, a weak uranium price and high operational costs.

In December 2013, an accident occurred when one of the 12 leach tanks in the mine's processing plant collapsed causing a leachate spill which, according to Rössing was fully contained onsite and had no impact on the environment. The real cause of the accident was not revealed by the time this article was written. A similar accident occurred in the Ranger Mine in Australia and the government has not yet given authorisation for the mine to re-open due to the safety concerns regarding this leach tank.

3

Health effects of uranium mining

There is no such thing as a safe dose of radiation (IEER, 2006). In uranium miners, cancers may take years or decades to develop. Causation of health problems like cancer have been linked to uranium mining through large epidemiological studies with lifetime follow-up (Brenner et al., 2003). For example miners of the former Wismut uranium mines in eastern Germany received compensation after closure because they suffered from lung cancer (Kreuzer et al., 2003). However, science has yet to find a way to prove causation in particular cases (Connor, 1997). It's therefore very difficult for workers in developing countries like Namibia to prove causation (of their health impact and radiation) and obtain compensation.

In Namibia, several studies confirmed health impacts on workers:

- In their 1992 study "Past exposure: Revealing health and environmental risks of Rössing Uranium" Greg Dropkin and David Clark concluded that "workers in the final product recovery area were exposed to very high levels of radiation in the period up to 1982, and even now their exposures are significant. Their lifetime risk of fatal cancer is probably at least 1 in 25 and possibly as high as 1 in 9. The workforce at Rössing has not been told the truth about the dangers they face."
- In 1993 and 1994, Dr Reinhard Zaire from the Benjamin Franklin University in Berlin, Germany, studied 473 current and former Rössing mineworkers, and discovered changes in the chromosomes of their lymphocytes (white blood cells) (Zaire et al., 1996). This condition could pose an increased risk of cancer (Zaire et al., 1996). Once the people in authority were aware of the results, the authorisation for further studies was withdrawn and publication of the results banned. Two international experts appointed by Rössing refuted Dr Zaire's findings.
- A qualitative interview-based study carried out in 2008 by LaRRI (Shindondola, 2008) revealed that many mineworkers complained of illnesses they attributed to their work at Rössing. The study concluded that:
 - Workers were not informed adequately about the dangers associated with uranium mining



- Many workers were exposed to dust and inhaled radon gas on a daily basis
- Some current and former workers contracted respiratory diseases such as TB and lung cancer
- Many workers developed chest and breathing problems
- Workers no longer trusted the opinions of Rössing's medical staff, because they believed that the true nature of their health problems was never revealed.

The current reports build on this work. The results and conclusions of the study are discussed in the following chapters.

4

Methodology

Two questionnaires have been designed; one for former and one for current mineworkers.

The questionnaires contain six sections:

- Section A: Personal information
- Section B: Working conditions
- Section C: Safety and radiation
- Section D: Health condition of the workers
- Section E: Living conditions
- Section F: Lifestyle and diet

Prior to the research project, a preliminary test on the two questionnaires was carried out with some workers and recommendations were incorporated.

The snowball random method of choice was used in order to choose who to ask to complete the questionnaire. In the "Snowball effect" method, a researcher picks an individual from a population of their research and this individual respondent would then lead the researcher to more respondents for more data collections.

The filling of the questionnaire was carried out by three researchers of LaRRI. The data collection part took three days to complete. The interviewers used the questionnaires to guided their questions and recorded each interview with a voice recorder. Each researcher focused on the three main languages spoken by the workers; English, Afrikaans and Oshiwambo. Permission was given to carry out the study by a local authority in Arandis, Mr. Asser Kapere who commended the project.



5 The findings

5.1 The data

In total, 50 interviews were conducted of which five were not transcribed. 44 of the respondents were male and one female. Another female interviewed is not a Rössing worker but she tells the story of her late husband who worked for Rössing and has now passed away. He was on sick leave and she believes he passed away due to exposure to low-level radiation.

The other woman is a truck driver. As she proudly stated, the first-ever female truck driver at Rössing. Only one worker lives in Swakopmund; all other miners interviewed reside in Arandis. 12 respondents are former workers and 32 are still employed with Rössing.

The age range of the respondents at the time of the interviews is summarised in Table 1.

Age Range	No of Respondents
20 - 29	6
30 - 39	5
40 - 49	9
50 - 59	12
60 +	12

Table 1
Age analysis of workers

Of the 35 workers employed by Rössing, five started as contract workers and were later employed by the mine, three are still contract workers. The position of 6 workers is unknown. Table 2 and 3 indicate the number of years worked for the mine and when they started. Table 4 indicates the positions occupied by the respondents in the study whilst Table 5 indicates where the respondents are from.



Table 2
Years workers started working at Rössing

Year started working	No of respondents
1970s	13
1980s	6
1990s	10
2000s	15

Table 3
Years of employment at Rössing

Years of Employment	No of Respondents
1 to 9	13
10 to 19	7
20 - 29	12
30 & more	12

Table 4
Position and number of respondents

Position	No of Respondents
Plant Operator	9
Mechanic	6
Truck Driver	5
Technician	5
General Worker	3
Handle Uranium	3
Sampler	2
Pit Operator	1
Retriever	1
Steel Operator	1
Environmental Controller	1
Security Guard	1
Unknown	6

Table 5
Number of respondents from different home regions

Home Region	No of Respondents
Northern Namibia	26
Erongo	12
Arandis	3
Otjozondjupa	1
Hardap	1
Unkonwn	1



5.2 Working conditions and Safety & Radiation

It is remarkable how Rössing changed safety and health policies during the years of operation. This is apparent in most of the respondents interviewed. When Rössing started producing uranium in 1976, no safety and health policies were in place. It is not clear when the policies were installed. Some workers said it happened after independence in 1990, some said this was done earlier. It is believed that Rössing started introducing safety regulations in the early 1980s and were upgraded continuously.

Miners who started working for Rössing at the early years of operation, were not protected against exposure, be it dust or radiation or both. Moreover, they had no knowledge about the danger uranium mining poses.

According to the statements of the workers, currently the safety measures are high; the workers are trained on a regular basis and undergo refresher courses once a year. The safety policy is updated from time to time and displayed at the notice board. Some receive the updated policy by e-mail. Shop stewards and foremen remind the workers constantly to adhere to the safety policy. The workers are told: *“The way you come to work is the way you should go home.”*

All interviewed workers said they are familiar with the safety policy. 27 workers said that the policy is good. 9 workers said that the policy came into place only many years after Rössing started production, some believe this happened after Namibia became independent in 1990. Only 3 workers said that the safety measures are not good and five did not want to answer the question. One worker said that he used to work for Areva's Trekkopje mine before working for Rössing and that the safety regulations at Rössing were 100% better than at Areva. One miner said that if a worker raises a safety issue, it will immediately be inspected and improved if found to be necessary.

Currently all Rössing's mineworkers wear PPE (Personal Protective Equipment) according to the section they work in. 3 workers said that the PPE is only available since independence. A normal PPE consists of an overall, dust masks, safety shades and boots. The dust mask is only worn in dusty places. In the acid plant, acid proof overalls and respirators are compulsory. In certain sections the workers wear gloves and in others gas masks. Workers handling uranium and chemicals wear a white overall. Some miners doubt the safety of this equipment.

In total 35 workers said they wear a dosimeter of which five wear it every day; their dosimeters are marked with their name. Three of these five workers are plant operators, one is a security guard and one said he does general work, also in radiated areas. 30 workers said they wear a dosimeter sometimes, in many cases depending on the dust content in the air. Some respondents think of the dust as radiant gas. They share a dosimeter with others working in the same department. One worker said he wears a dosimeter once a year and another once a month. Nine workers said they never wear a dosimeter. See table 6.

Table 6
Distribution of dosimeters

Wear own dosimeter every working day	Wear dosimeter sometimes & share with others	Never wear dosimeter	No of respondents
5	30	9	44

Even though they receive courses on safety every year, some workers still confuse dust with radiation. They believe wearing PPE protects them from radiation. This is what they are told by Rössing. One worker mentioned that he was told to be careful at work because of radiation. He doesn't know how to be careful.

Some remarks by workers on safety and radiation:

"Yes, we know uranium can give us cancer so we have to be careful with wearing protective clothes. And we must shower after work and put on our own clothes. Then they say it is fine."

"In the years when I started it was unsafe. There were no safety masks, there were just kaki overalls. We worked with those and went home with them."

"Rössing is a company that is very much into safety. They always talk about safety. In every section the Foreman is supposed to have a safety talk before he can assign tasks to people. Every day in the morning we have a ten minutes safety talk. Safety-wise, they are ok."

"There are rules. They call them lifesaving rules. From my own understanding, the lifesaving rules are not for us. It is for the company to cover themselves up if something happens. I am not going to hurt myself and nobody else will. The rules are such as wearing a safety belt. If some of the senior people see you are not wearing the safety belt the punishment they give you is unfair. They will give you a final warning. How can you give somebody a final warning for safety belt? I know it's a rule and that we must obey it. I understand but to give someone a final warning for a safety belt is not fair. That is why I was saying that the rules they are making, is just to cover the company."

"At the time we started we didn't have the masks, glasses etc. The safety measures only came recently. In the beginning we used our hands to clean the uranium without having anything to cover ourselves."

"In the past the machinery at Rössing were a bit heavier to handle and had no technologies. This damaged our health. The dust in the early years was too much; before 1991 that is dating back to 1975. The working conditions were hazardous. Things were not good. The eye protection shades were not good. The machinery



we used did not have canopies to protect us from all exposures. Until up to now, the people who started working in those years have health problems now.“

“The masks don’t really help; they are always full of dust.”

5.3 Health conditions of workers

Many workers complained about the tough working conditions causing them back pain, breathing, hearing and visual problems. Most of those are operators of heavy equipment. The biggest trouble however is said to be the constant exposure to dust.

Most workers complained that they are not informed about their health conditions. They generally don’t know whether they have been exposed to radiation or not. Some workers consult a private doctor to get a second opinion while most can’t afford it.

It raises questions that none of the workers was ever diagnosed with a specific illness, except one current worker; he is 61 years old and works for Rössing as lab technician since 1990. He stated:

“Yes. I have cancer now. In the beginning the mine didn’t want to give me money for the treatment but later when they referred me to a doctor in Windhoek for an operation they gave me money for treatment. I am healthy now.”

The questionnaires revealed that out of 32 current workers only 9 said they have no health problems (or no “change in health condition” as some of them put it). Two current workers are on sick leave since 2000 and 2003 respectively. One respondent worked as a laboratory technician for 24 years and has proof that he was contaminate. The other one has been an open pit operator for 19 years. His health problem is unknown to us.

One former worker was employed for 35 years. He had a leg amputation, suffers from high blood pressure and diabetes. One former worker was employed for 4 years as a diesel mechanic fixing earth moving equipment in the open pit. He said that his body gets shocks like from electricity and is vibrating all the time.

All health conditions and problems are summarised in table 7.



Table 7 below shows respondents number, whether former or current worker, age, years employed, health condition, tobacco and alcohol consumption and position at work.

Number C/F worker	Age	Work years	Health condition	Smokes tobacco	Since years	Cigarettes per day	Drinks alcohol	How much alcohol	Working position
1/current	34	2	Allergies, breathing problems	Yes	10	6 to 8	Yes		Plant operator
2/former	42	5	No health problems	No			No		Steel operator
3/current	63	19	Since 2003 on sick leave	Yes	15	5 to 6	No		Open pit operator
4/current	60	23	Back problem	No			Yes	sometimes a beer	?
5/former	59	37	High blood pressure	No			No		Motor Mechanic
6/former	60	37	High blood pressure	No			No		Plant operator
7/no record									
8/current	31	7	Headaches	No			No		Plant operator
9/current	50	20	Headaches & diarrhea	No			No		Plant operator
10/former	64	35	High blood pressure	No			Yes	only weekends	Environmental Officer
11/current	63	7	Headaches	Yes	10	4 to 6	No		Plant operator
12/current	62	38	Asthma, diabetes	No			No		Stallman selling goods
13/current	50	?	Hearing problems	Yes			No		Plant operator
14/current	45	20	Headaches	No			No		Driver & painter
15/current	49	11	No change, female	No			Yes	sometimes a glass of wine	Truck driver
16/current	61	35	High blood pressure	Yes			5 Yes		?



17/current	68	32	Heart problems, had heard OP	No		No		Security guard
18/former	56	24	Very ill, has proof that he was radiated	No		No		Lab technician
19/no record								
20/no record								
21/former	32	4	Body gets shocks	No		Yes	1 beer/day	Diesel Mechanic (worked in pit)
22/current	57	32	Hearing problem	No		Yes		Fitter
23/current	42	20	Back injury when blades of machine got stuck	No		No		Was survey assistant, later blaster, now technician
24/current	64	17	Not good, doesn't explain	No		Yes		Packs uranium
25/no record								
26/current	51	24	Feels very weak	No		Yes	sometimes a beer	Moves uranium from one place to another
27/current	48	21	Kidney problems, back problem	No		No		?
28/current	59	36	High blood pressure	Yes	21	Yes	when he gets it	First plant operator, now works in the laboratory
29/current	41	11	No change in condition	No		Yes	4 beers/week	Fitter
30/current	61	23	Cancer (no more info)	No		No		Lab technician
31/current	41	17	Too fat	No		Yes	once/day	Truck driver



32/no record

33/current	36	6	Unknown	Yes		10 to 12	Yes	twice/week	Sample
34/current	28	4	Feels weak and tired	No			Yes	occasionally	Sampler in geology department
35/current	33	3	No change in condition	Yes	13	6	Yes	likes beer	Electrician
36/current	26	3	No change in condition	No			Yes	only weekends	Repairs leaks pipes & tanks etc.
37/former	?	34	High blood pressure	No			No		General work cleaner also in radioactive areas
38/current	22	3	No change in condition	Yes	5	4 to 5	Yes	every 2 weekend	Radiation worker
39/current	28	12	No change in condition	Yes		2	No		Plant operator watches conveyer & crusher
40/wife of former worker			Wife of former worker who passed away. See her story below						
41/current	58	34	No change in condition	No			Yes	2 beers/day	Plant operator
42/former	50	17	TB	No			Yes	most of the time	Works at building supply
43/former	52	24	Bad eyes, says has a tumor, no explanation	No			Yes	very little	21 years mixed uranium, later plant operator
44/former	63	35	TB (because of dust)	No			No		Fitter & boiler



45/former	65	35	Leg amputated, high blood pressure, diabetes	No		No		Driver
46/current	22	3	Not yet change in condition	No		Yes	some weekends	Works at fuel filling station
47/current	22	5	Not yet change in condition	No		No		?
48/former	53	22	Is not sure about his condition	No		No		Retriever
49/current	45	7	Not really healthy	Stopped 1996		No		Lab technician
50/current	48	20	Not fit anymore	Yes	long	Yes	2 beers/day	?
51/current	54	30	High blood pressure	No		Yes	2 beers/day	?

Of all respondents, 38 workers were employed by Rössing for a long period of time (13–37 years) while 6 have been employed for 5 years or less. The latter group are those that stated they don't have health problems (only one worker feels weak and one has breathing problems). **It is obvious that illnesses occur mainly in workers serving Rössing for many years.** Some workers suffer from more than one disease. See table 8.

Table 8
Health conditions related to years of employment

Health condition	Total workers affected	Current workers	No of workers & years employed	Former workers	No of workers & years employed	Remarks
No health problems, Not yet changes in condition	10	9	2= 3, 1=5, 2=11, 1=12, 1=34	1	1=5	
High blood pressure	8	3	1=30, 1=35, 1=36	5	1=34, 2=35, 2=37	



Weakness, fatigue, not fit anymore	6	4	1=4, 1=7, 1=17, 1=20, 1=24	1	1=22	
Cancer	2	1 (lab technician)	1=23	1 (mixed U, later plant operator)	1=24	Both cases were not explained in detail. Workers should be contacted
Headaches	4	4	2=7, 2=20			
Hearing & eyesight problems	3	2	1=7, 1=32	1	1=24	Bad hearing attributed to blasting, bad eyesight to dust
Back problems	3	3	1=20, 1=21, 1=23			Due to heavy work
TB	2			2	1=17, 1=35	
Diabetes	2	1	1=38	1	1=35	
Breathing problems, Asthma	2	2	1=2, 1=38			
Heart problem	1	1	1=32			Had heart operation
Kidney problem	1	1	1=21			
Multiple problems	1			1	1=35	Leg amputation, high blood pressure, diabetes
On sick leave	2	2	1=since 2000, 1= since 2003			1 has proof that he was radiated

Rössing has a health policy. 36 workers said they knew about the policy, 20 workers said they know the content, and 10 said that they don't understand the policy. Some workers are on the health & safety committee. It was confirmed in the research by respondents that applicants undergo thorough health tests before they are employed. Only absolutely healthy candidates are accepted.

Health tests are done once a year for general workers, twice yearly for those working in high-risk areas. The health tests consist of examination of ears and eyes, blood and urine and x-rays of the lungs. Some workers said that they are shifted to other areas if health tests reveal that they were exposed to radiation.

If one worker has such serious health problem that is allegedly connected to the type of work he does, how about his colleagues who remain in the same department?

Below are some of the responses of the respondents to a few questions.



Question: Are you informed about the results after medical check-up?

"I was always fine they said."

"Sometimes yes. 3 years back they started to tell the people. But before that we were never told."

"Not at all, they won't give or tell your results. You will only find out maybe if you go to a doctor and when you will undergo certain tests then it's when the doctor can tell you if you have a problem e.g. maybe one of your eyes is not seeing properly or ears can't hear properly."

"Doctors were told not to inform us with our results or tell our illness. As you know she is also just working for the company and she just has to obey to what she is told. These have become a very dangerous issue since you are sick and never informed about your sickness. They only supply you with medications until you are totally almost finished up or about to die it's when they will tell you what your sickness is. I even had a friend who died of cancer but he was never told about his results. They were supposed to tell him. It was very painful news to hear that he died of cancer while he has been going for the test and was never informed."

Question: Would you have worked at the mine if you knew the long-term health implications of working there?

23 workers answered no, of which 12 said they had no other choice because of unemployment and families to be looked after. 2 workers said they will not work at Rössing for long (one said only for 5 years). 9 workers answered this question with yes, with one worker stating that Rössing is good and safe. Other 3 stated they knew the implications and one added he couldn't do anything else.

"You gamble with your life and will maybe be ill when you are old."

"The problem is that there are not many jobs. That's why people will work anywhere. When your children are crying for hunger you will go."

"We hear things but we don't know what actually is happening, we just hear the rumours. Sometimes they say you must not work longer than 5 years there but we have never gotten an official letter about that. "

"I understand you must only work for 5 years with uranium, after that you must do something else. The thing is just that if you are unemployed and your family needs money than you will go! If you need money you can't think of the dangers. It's dangerous but we need the money."



“No, if the area is dangerous then I wouldn't. But Rössing has dangerous areas but we know there are safety measurements in place. We know what is going on in the area. They tell us that we are safe if we wear the clothes so it should be ok, but we don't know. Yes, we know the implications. If we work for a long period, for years, you can become sick but if you use Personal Protective Equipment, the safety equipment of the mine, you will be okay. If you work where there is uranium, especially in the sand pit where you work directly with the uranium, they give you all the PPE to protect you.”

“What they told us is that our uranium is not so strong as in the other mines. That's why you can work a little longer here at Rössing than in the other mines. In the other mines it is very strong, you can only work for 5 years, then they tell you to resign. Here at Rössing the radiation is very low and it depends from us also. We choose when we want to go. For example if I have worked here for 20 years then I can say I want to be retrenched. It's our own choice. When the retrenchment comes we can also opt for that if we know we have worked here long.”

“If the mine is safe and you can work then yes. But if it's unsafe then no, not for long years.”

Question: Do you know of others who have experienced changes in their health since they started working at the mine? If so please explain.

Only four workers said that they don't know anyone being sick because of working in the mine. Those are young workers, who started work with Rössing only recently and probably have no contact with former or older workers. **The older workers all said they know miners dying of cancer and other diseases, mainly after retirement.** The stories they tell about their former and current colleagues and family members are very disturbing.

Since the impact on the worker's health due to low-level radiation exposure only shows after a long period of time (5, 10 or even 20 and 30 years), the workers frequently get ill and pass away after retirement.

“The men I worked with in the lab in those years has also a history of unsafety. We had to test the pek, test the yellow cake with our mouth [he means they had to pipette yellow cake with the mouth, Author's remark]. We didn't know. I'm not the only man. My colleague, Goumab, is also sick. He is at the farm but presently in the hospital. Also in a wheelchair. In the beginning there was no safety policy.”

“When my uncle started working for the mine he was healthy. He started in 1984 without any illness but he got diagnosed last year with cancer. I think it comes from the mine because he is always working there. He works as an operator in the open pit.”



“I know a lot of them. But I cannot remember their names. You should just ask others as well around here in Arandis. What you can do is find former workers such as Kashuto. He knows more and can explain to you in more details. He told me that he is not anymore an ordinary leader but a president in trade unions. With him, you can find maybe all the things about Rössing and other union members who had problems that are linked to Rössing. He used to be a great advocate for the cause of the workers. I do not know now whether he still has the same passion. He helped us a lot and we helped him too. We worked well as a team. “

“People get sick. We are seeing it in people that have worked for Rössing for a long time. They just go back and die after working for Rössing. When there was radiation in the air, they told us to wear the mask at all time. The only thing that happened which is a bit saddening is that they come and test the area while you are there already and maybe have exposure already.”

“Yes, most of them that I know of have retired. Some of them just spent very few months and they died. They were diagnosed with a lot of sicknesses like TB, lung infections and cancer.”

“Some died and some left the work due to illness.”

“Yes, there is a colleague whose health has been disturbing him so much and he never got well. He only worked this month, next one he is away with the illness again. But he ended up resigning due to his health problem. He spent 12 years home because he is sick. They wanted him to get back to work but he couldn’t.”

“Yes, I know somebody who is no more working here, who became very sick, and it was spoken about that he suffered due to the exposure to radiation that he got sick. But it’s something I don’t have a prove of, but there were some indications and the person is very sure himself.”

“Oh! A lot of them died.”

“Yes, some go home because of sickness.”

Question: Did you have an accident while working for the mine?

25 workers said they did not have accidents while 12 said they had an accident and 8 did not answer the question. One worker was hit by a peace of iron and injured his back. After recovery he was transferred to the laboratory. One worker was involved in a car accident at the mine site. 3 workers accidentally got their hands cut and one poured acid over his feet. The others said their accidents were minor. They were all treated at the Rössing medical center.



The workers were asked whether they ever received medical treatment at the mine's medi-clinic. 38 workers said they did receive medical treatment. In some cases for flu, headache and other minor illnesses. 4 workers said they never got treatment at the clinic of which 2 were still young and did not complain about any changes in their health condition. **One contract worker said that they don't have the privilege to be treated by Rössing because they are not employed by the mine.**

Question: Who cleans your working clothing?

All workers said that the washing is done at the mines laundry. They can hand their clothing in as often as they like. When the mine started production in 1976, the workers went home with their working clothes on and they had to be washed by themselves or their wives. The older workers stated that washing at the mines laundry started in the late 1980s.

5.4 Living conditions and Lifestyle & Diet

Uranium mining companies generally deny that their workers get sick because of exposure to radiation. They blame the bad health conditions to unhealthy lifestyle such as eating habits, tobacco smoking, alcohol and sexual promiscuity, which they claim result in HIV/AIDS. For this reason, the workers were also asked questions about their lifestyle and their diet to understand if these could have been possible causes

Herewith are the findings. Of the 44 workers interviewed, 11 workers smoke. The smoking habits and diseases are summarised in Table 7. Workers are not allowed to smoke during working hours, which doesn't leave much time for smoking. It is well known that smoking can cause cancer and other respiratory diseases. However, of those questioned and suffering from serious illnesses all are non-smokers.

When asked about their drinking habits, 23 workers said they consume alcohol. However, drinking seems moderate, since each person entering the mining site gets tested through a breathing device detecting alcohol consumption. As one of the respondents replied:

"I work night shift, I like to drink one or two in the day. But not in the afternoon. because before you enter the mine they will test you, you have to be sober."

5 respondents said they only drink on weekends when they are off from work. Some said they drink 1-2 glasses of beer per day, one said he drinks most of the time and another said that he drinks alcohol when he gets it. 19 workers stated they "don't touch alcohol".



Their diet seems to be fairly balanced and consists mainly of meat, bread, macaroni, pap (porridge made of maize meal) and vegetables. None mentioned lack of food or going hungry. 18 workers said they have 3 meals a day while 16 have 2 meals a day. All workers except 2 assured that they eat in the lunch room assigned to them. They are not allowed to eat or drink at their working place. The 2 exceptions are truck drivers. They claim there is no time for proper meals so they eat in the truck when the work allows.

6

Conclusions

Uranium mining has undoubtedly value addition to the Namibian economy being one of the main exports of the country. With the alarming unemployment rate in the country, Rössing Uranium is also contributing towards this national challenge. However, the cases of workers who fell ill while or after working for Rössing raises the alarm as to whether this remedy is justified.

Without undoing the progress that the Namibian economy enjoys from uranium, it is equally important to consider the life of the Namibians who take it upon themselves to steer this economy by working under conditions of low-level radiation. There must be strict requirements in place to protect every Namibian worker.

This study unambiguously demonstrates that the workers pay a high price for the benefit of working with the giant mining company Rio Tinto.

At the time the study was carried out, around 1,500 workers were employed by Rössing Uranium. 44 questionnaires were carried out, recorded and analysed in this study. Although it may not be representative of all workers, the study shows a clear trend towards negative health impacts on the workers. This is corroborated by their perception of fear towards their future health condition and the insecure fate of their families. Most workers stated they would rather not work in Rössing uranium mine but had no other choice because they needed to earn a living and support their family. Many workers pass away shortly after retirement, unnoticed in their hometowns or villages where no data for statistics are collected.

This study raises the alarm indicating that something must be done to reach a more comprehensive insight into the fate of the mineworkers and their families:

- A large-scale epidemiological research must be conducted to uncover the real situation giving the workers some hope for justice and security for their immediate families. This is an urgent call to relevant government institutions and ministries, Rio Tinto's Rössing Uranium and the Mine Workers Union of Namibia to perform such a study.

- It is of utmost importance that the Ministry of Health and Social Services gets unrestricted access to the medical reports of all workers employed by Rössing



Uranium in order to get an overall picture of the worker's conditions. The content of these medical reports should contain the number of past and present cancer cases of former and current workers to be compared with countrywide cancer cases.

- Likewise mineworkers should have access to their own medical reports so they are informed and not left in the dark about their own health status.

- An independent team comprising medical experts should examine those workers that are no longer working in the mine because of medical disability, no matter whether they reside in Arandis or have moved back to their hometowns. Furthermore, the health condition of all workers who started working for Rössing Uranium at a time when no health regulations were in place (between 1970s and early 1980s) must be examined by an independent medical team.

The entire process must be transparent and trustworthy and the results must be made accessible to all stakeholders. Possible necessary steps following the above mentioned research must be discussed and agreed upon with all stakeholders.



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