

93401



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# TOP SCHOLAR



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA

## Scholarship 2013 Geography

9.30 am Saturday 23 November 2013  
Time allowed: Three hours  
Total marks: 24

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

Pull out Resource Booklet 93401R from the centre of this booklet.

Carefully read the instructions on page 2 of this booklet.

Answer ALL three questions in this booklet. Each question is worth 8 marks.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–24 in the correct order and that none of these pages is blank.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

You have three hours to complete this examination.

## INSTRUCTIONS

The materials in Resource Booklet 93401R will enable you to become familiar with the theme and contexts of this examination: the mining of metallic minerals. You **MUST** specifically refer to information in the resource booklet in your answers, as well as knowledge and ideas you have gained from your studies in Geography.

You are advised to spend the **first hour** of the examination **carefully reading** the resource materials, and then to spend **40 minutes** answering **EACH** question.

Read the three questions on page 3 carefully. You should answer **ALL** three questions.

Space for planning has been provided on pages 4, 10, and 16 of this booklet that will help you write your responses. These notes will not be marked. The questions on page 3 are repeated on their respective planning pages.

Begin your answer for Question One on page 5, for Question Two on page 11, and for Question Three on page 17.

### **QUESTION ONE (8 marks)**

"It is clear that there is greater detriment from mining than the value of the metals which the mining produces."

Agricola, German scholar and scientist, *De Re Metallica* (1556).

Critically evaluate the impacts of the mining industry on people and places across the globe.

Your answer MUST include:

- specific information from the resource booklet about at least TWO countries
- knowledge and ideas you have gained from your studies in Geography
- relevant original and/or adapted visuals, such as maps, graphs, and diagrams.

*Use page 4 to plan your answer, and begin your response to Question One on page 5.*

### **QUESTION TWO (8 marks)**

Discuss, with reference to different perspectives, who should benefit from mining.

Your answer MUST include:

- specific information from the resource booklet
- knowledge and ideas you have gained from your studies in Geography
- relevant original and/or adapted visuals, such as maps, graphs, and diagrams.

*Use page 10 to plan your answer, and begin your response to Question Two on page 11.*

### **QUESTION THREE (8 marks)**

"The phrase 'sustainable mining' appears, at first glance, to be a simple oxymoron – an obvious paradox."

Critically analyse and discuss what the future of the mining industry might be. Justify your opinion.

Your answer can be EITHER in diagrammatic OR essay format, OR a combination of both (a diagrammatic answer could extend across more than one page).

Your answer MUST include:

- specific information from the resource booklet
- knowledge and ideas you have gained from your studies in Geography.

*Use page 16 to plan your answer, and begin your response to Question Three on page 17.*

### QUESTION ONE (8 marks)

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#### PLANNING

Mining - Significant role in eco development  
Chile / Ghana / Brazil.

2.5 million miners globally

World Bank - 15-20 mill people working in Artisanal & small scale mining  
100 mill women & children reliant for livelihood.

Environmental impacts of mining - pollution (river, air etc)  
deforestation  
plant & animal deaths

Rehabilitation of land - in "formal" sectors

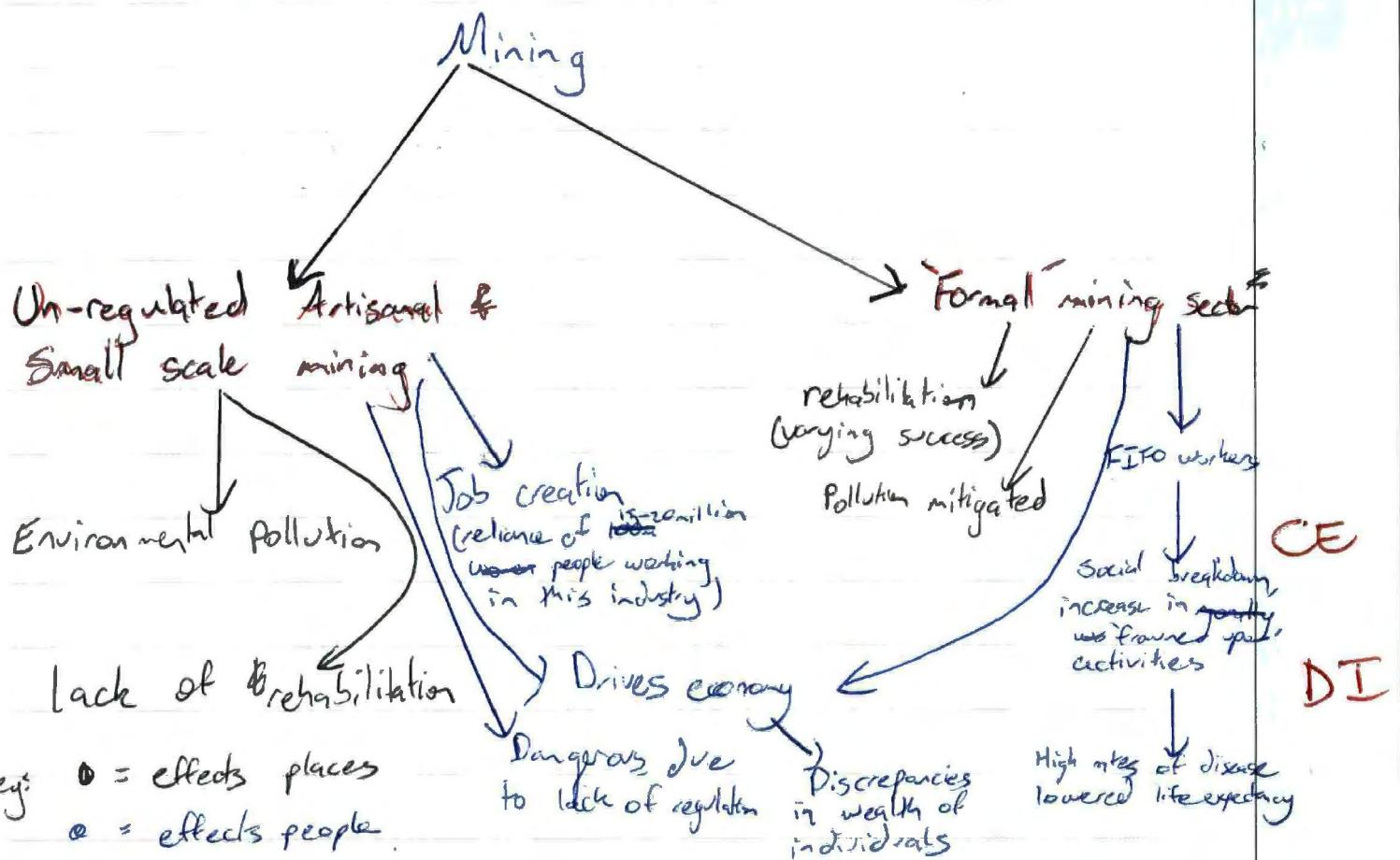
Migrant workers - susceptible to HIV and other disease  
South Africa - 50% HIV workforce

Socioeconomic benefits justified by environmental and resource costs  
Mining drives economy in Australia - however wealth not shared.  
"trickle down approach"

More social issues - drinking, prostitution, drugs.  
Utility value vs. intrinsic value - Aboriginals.

Begin your answer for **Question One** here:

## R- Summary of impacts of mining



Mining affects people and places around the globe in varying ways. One of the most significant reasons for this variation is the dominance of formal mining (often in MEDCs) which is highly regulated or Artisanal & small scale mining, which carries very few regulations that are successfully enforced.

and one of the most significant to people. One positive impact is the job creation that mining poses to a place. Australia will need employ an extra 24 million people in the mining sector by 2015, and this will allow more individuals

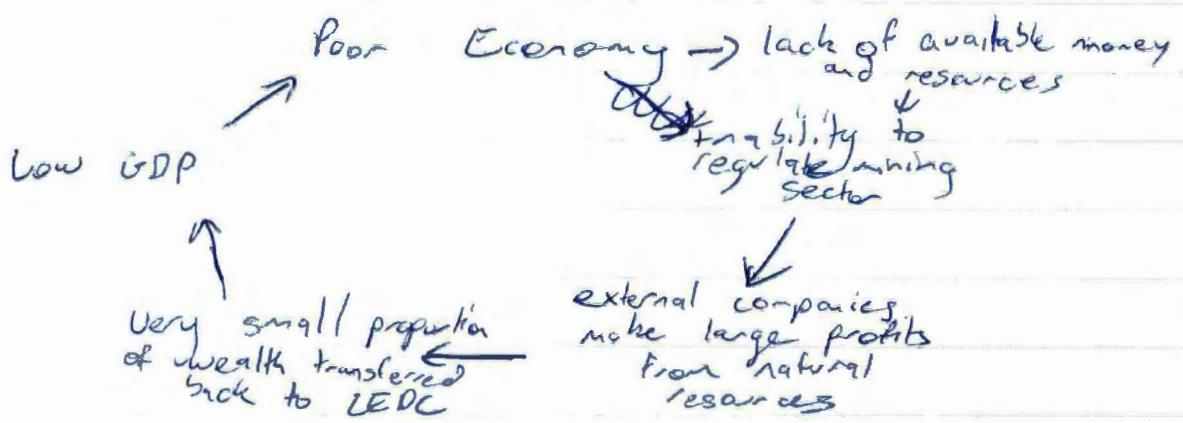
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to make a living. It also drives economic growth in places with vast mineral deposits. Namibia, in Africa, has one of the fastest growing economies in Sub-Saharan Africa and this is due to their reliance of mining & exploiting ~~of~~<sup>a majority of Namibia's exports are minerals</sup> their natural resources. This is a positive benefit to people, as it increases household income and helps drive families in LEDCs out of the poverty cycle. The World Bank estimates that 100 million women and children are supported by small scale mining operations around the world and these people would not be able to meet their needs without the income from the sector. However this direct benefit to the economy only impacts those directly involved in the mining industry. Many economies in MEDCs are based on a 'trickle-down' economic approach, whereby the belief is that if individuals benefit from sectors such as the mining sectors, these benefits will eventually 'trickle' down to lower socioeconomic individuals ~~through~~ through taxes and social spending. However this has been proven to not be the case, and so these high wages live the gap between the rich and the poor in countries.

Australia is an example for this, where the states in Australia which does not have the mineral resources to rely on as Queensland and ~~western~~<sup>WA</sup> Australia do, have been in economic decline, and with rising prices driven by the high value of the

Australian dollar, their disposable income has dropped, meaning they face significant economic impacts from not being directly involved in mining. Also, many LEDCs do not have the economic strength to fully regulate mining in their countries, so <sup>external</sup> capitalist companies, can exploit their poor economy and ~~not~~ eliminate much of the economic benefit that is to be gained from the ~~LED~~ minerals for the LEDC. Peru has not benefitted from its mineral deposited to the extent that it could have done, because, due to their weak economy, Big players (external companies) have taken advantage of their weak economy which does not allow the same regulatory strength as in MEDCs. This is outlined in Figure 1B.

Figure 1B: Cycling diagram showing interaction between LEDC's economy and ability to control mining sector.



DI

There are also significant environmental impacts of mining. These have the largest differences between Environmental impacts are where the largest discrepancies occur between the formal sector and small scale mining. It Due to the heavy regulation of the formal sector impacts on the environment e.g.

pollution and changes to land have to be mitigated, and upon closure of a mine, the land has to be rehabilitated. Because of these reasons, the environmental impacts caused by the formal sector ~~as~~ have relatively low significance. However, in small scale mining operations, no regulations prevent damage to places. The waste from mining is often just dumped back into the environment, with pollution flowing into water ways and the mines having significant air pollution. ~~The~~ Deforestation and land degradation occurs prior to the building of a mine, and when the ~~resources~~ minerals are fully mined, this ~~is not~~ impact is not reversed as it is with rehabilitation in the formal sector. This leaves serious visual pollution, as well as having detrimental effects on nearby ~~industries~~ industries. In Burkina Faso Agriculture has suffered ~~severely~~<sup>heavily</sup> from the effects of mining, as many farmers near the Bissa Gold Company mine have been dispossessed of their crops, with very little compensation, and pollution to waterways has severely impacted on people downstream of the mine, ~~the~~ river pollution has also damaged marine ecosystems, with extinction to many fish species, some of which indigenous people rely on for necessary protein and for an income. This was summarised by Georgius Agricola "Further, when the ores are washed, the water which has been ~~poisoned~~ used poisons the"

brooks and streams, and either destroys the fish or drives them away. However it is important to recognise that as mineral exploitation drives economic growth, more regulations will begin to be put in place and enforced, to mitigate environmental impact.

Another cost to consider is the social costs of mining in remote areas and the deterioration this causes to social systems and behaviours. It is often seen that ~~FIFO~~ workers these mines increase 'frowned' upon behaviour, such as prostitution, crime, drug use and alcohol consumption. The local communities, such as those in Australia, do not benefit from FIFO worker's spending besides the spending on alcohol and fuel, and their behaviours are detrimental to the local communities. This trend is mirrored in South Africa, and in fact in both the formal & small scale mining industries. It also impacts on the workers themselves, increasing their ~~at~~ susceptibility to disease and the dangerous ~~large~~ working conditions often lead to a reduced life expectancy. In South Africa HIV prevalence rates ~~are~~ amongst mining work forces are as high as 50%, and other work related injuries & risks e.g. lung cancer prevalence rates are higher. Because of this, mining often has a very significant detrimental effect to miners themselves and to local communities.

Therefore, different places have varying impacts on people and the environment.

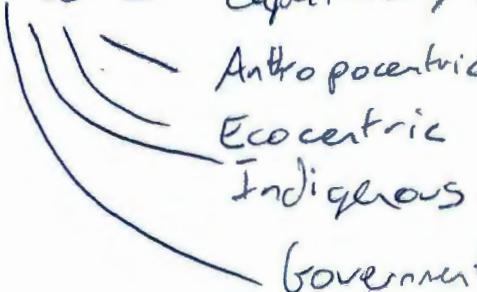
**QUESTION TWO (8 marks)**

Discuss, with reference to different perspectives, who should benefit from mining.

Your answer MUST include:

- specific information from the resource booklet
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**PLANNING**

Perspectives - Capitalist / economic  
  
 Anthropocentric  
 Ecocentric  
 Indigenous / local  
 Government

Eco centric viewpoint - ~~mines should~~ benefits should not occur with ~~enviro~~ to the cost of the environment.

Government viewpoint - The benefits should go ~~to~~ to the country and so can 'trickle down' to all residents.  
 - diagram.

Indigenous / local - Ensure local communities are not harmed. A proportion of benefits should go to locals. Larger wages

Capitalist - Economic benefits, ~~not~~ interested in profits therefore ~~as well~~ some investors should benefit.

Begin your answer for **Question Two** here:

Many different individuals and groups stand to gain from mining often in an economic sense but also in a social sense as well. These benefits can be split differently between these groups and differing perspectives ~~would~~ believe that this split should occur in differing proportions.

A

Many people around the world with an ecocentric viewpoint would be interested in the environmental impacts of mining. However, there are very few benefits to be gained from mining for the natural environment from mining. In fact, in almost all situations, damage occurs to the environment as a result of mining. Therefore, the benefits to be gained from mining should first be allocated to sustainable mining in a sustainable fashion and reversing or mitigating any existing environmental damages. For instance, a ~~one~~ person with an ecocentric viewpoint would believe that a much larger proportion of profit from mining should be spent ensuring environmental sustainability.

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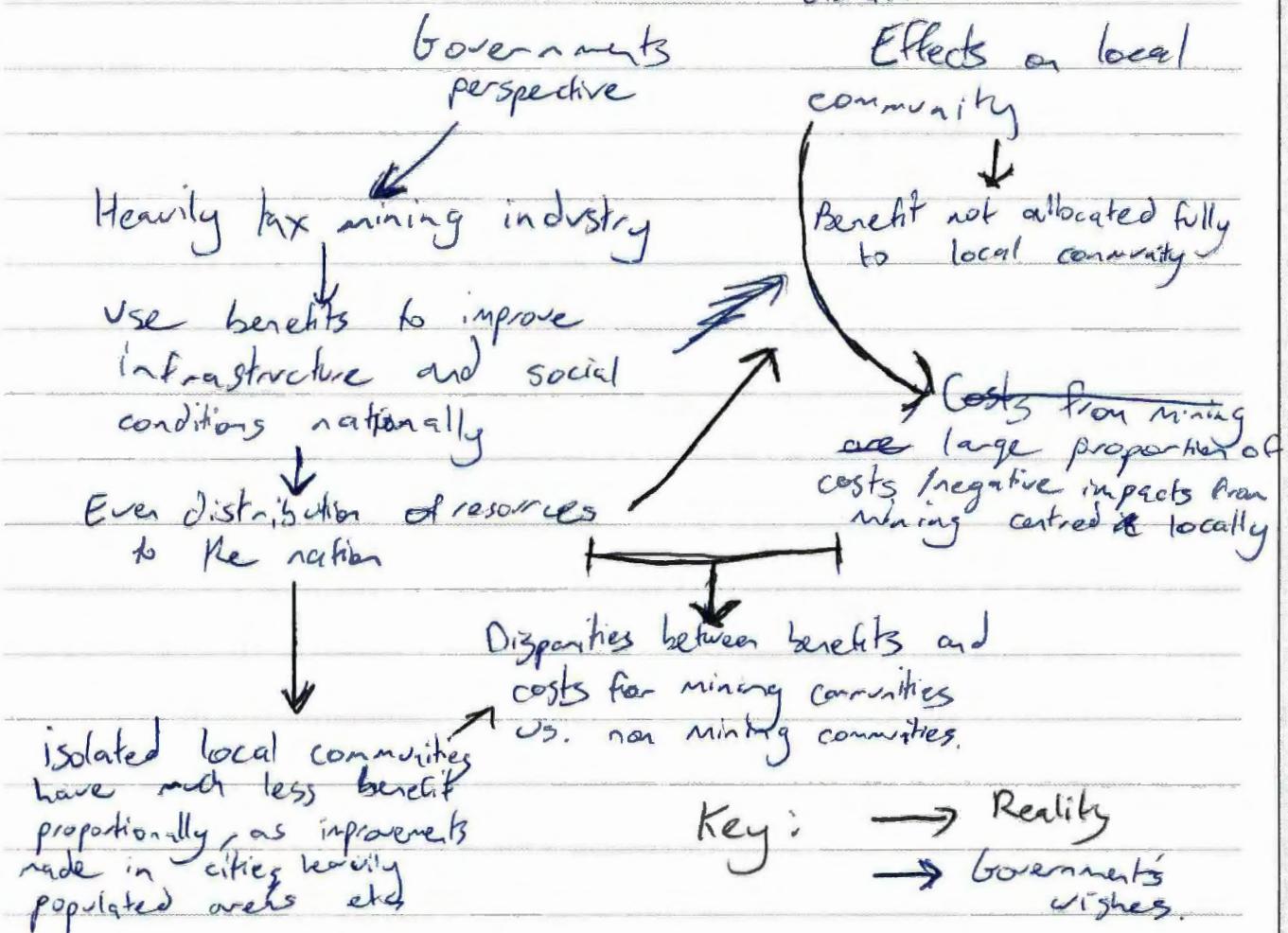
For instance, ~~the~~ in Peru, mining operations pollute the waterways, and this has a knock-on effect ~~for~~ on any river ecosystems. In PNG, the OK Tedi mine may have destroyed up to 200,000 hectares of forest and no benefits of mining appear to be allocated to reverse this damage. ~~Especially~~

A

The government has differing perspectives on how the benefits of mining should be allocated.

With the government's primary goal to improve the lives of all its residents, many governments, especially in LEDCs, would be wishing to implement heavy taxes on the industry, ~~and this is they believe~~ the benefits of their own resources should primarily be distributed ~~to~~ & back to their country. ~~For instance~~ Figure 2A demonstrates their perspective:

Figure 2A: Government's ~~wishes~~  
~~view on resource allocation vs. reality of cost distribution~~



As Figure 2A shows, while the government would want the benefit from mining to be fairly distributed amongst its residents, often these isolating

mining communities do not receive their fair share of resources, and if they did, this does still not fully compensate for the costs (economic, social & environmental) that they face.

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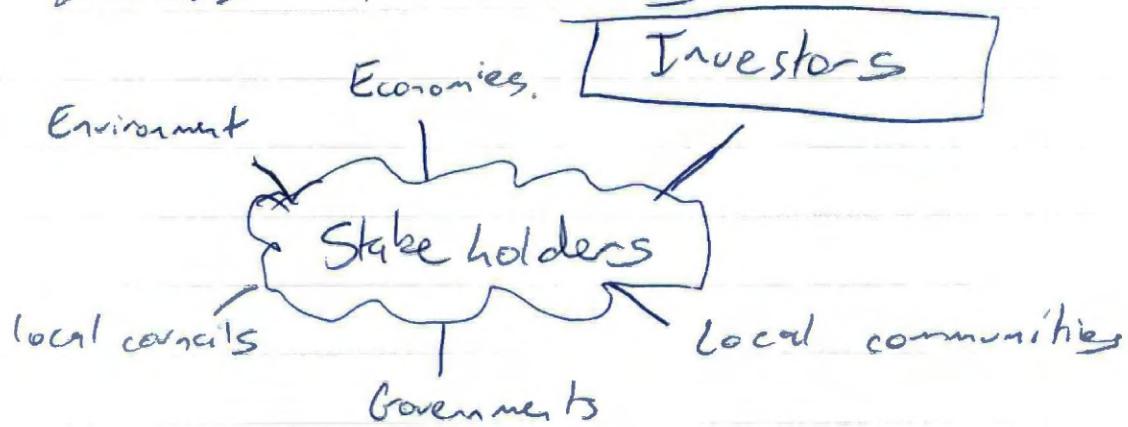
Another perspective showing differing beliefs is the local/ indigenous perspective. As resources are often located on indigenous land ~~and~~ such as the land of the Maori in Western Australia, and the local communities are used as a workforce for mines, many locals would hold a perspective that they should receive a much larger proportion of the benefits from mining as they currently are receiving. For instance the disparity between workers' pay and the large salaries of executives in Peru has been a contentious issue for debate, as many would feel like they are being exploited with unfair rewards. A ~~the government~~ This issue is compounded by the Peruvian government refusing to <sup>provide</sup> pay aid to impoverished mining communities. Because these resources are ~~allocated~~ located on ~~as~~ often remote land, locals often perceive that they should be receiving benefits from the mining rather than be detrimentally affected by it. The OK Tedi Mine in PNG has caused the destruction of crops of 50,000 villages living downstream and

A

These impacts are not effectively mitigated by the government or mining company. Locals would often share ~~a viewpoint with~~ beliefs with someone with an anthropocentric viewpoint, as they would very often be only concerned with the benefits being distributed to as many people as possible rather than just the few investors and executives which is currently occurring. However, due to increasing social pressure and the development of pressures to act in a moral way, ~~so~~ a number of mining companies have begun to invest back into the local communities. Barrick has allocated a much larger proportion of its benefits to locals by introducing schemes to improve child nutrition and maternity health in the Ancash & La Libertad regions of Peru and investing \$2 million in these schemes. Similar approaches have been occurring in South Africa where De Beers have invested heavily in HIV/AIDS prevention and treatment programs, a country with one of the highest HIV prevalence rates in the world. This trend may continue to ~~to~~ encourage others to follow similar behaviours so that the benefits allocated to local communities continue to increase in the future.

Finally, the owners and investors of the company

would have a very different perspective to all other groups. While most would primarily want to ensure no groups ~~or aspects~~ or aspects of the environment were detrimentally affected by mining, A capitalist perspective would focus solely on ensuring they got the greatest benefit possible for mining e.g. maximised profit. This is not only for personal gain but also because owners / Directors of large mining companies e.g. Barrick and Newmont have a responsibility to their stakeholders for success in business.



Traditionally only the desires of investors were taken into consideration when deciding on actions to be undertaken by the company, however increasingly, through the desires of investors, other stakeholders are gaining more influence over company decisions and this is apparent through, for example, the actions of Barrick in PNG, by investing \$1 million in solving violence against women.

**QUESTION THREE (8 marks)**

"The phrase 'sustainable mining' appears, at first glance, to be a simple oxymoron – an obvious paradox."

Critically analyse and discuss what the future of the mining industry might be. Justify your opinion.

Your answer can be EITHER in diagrammatic OR essay format, OR a combination of both (a diagrammatic answer could extend across more than one page).

Your answer MUST include:

- specific information from the resource booklet
- knowledge and ideas you have gained from your studies in Geography.

**PLANNING**

Sustainable mining – referring to ensuring that all groups and environments are not detrimentally affected by mining  
 Positive impacts on many groups.

Future – As non-renewable resources get "used" up, ~~the~~ their price increases.  
 Reduction in number of mines,  
 more land having protection  
 Increase in regulatory activity  
 More even allocation of resources

P.1. discuss implications of supply/demand for mining industry

P.2: more interest on positive impacts across the board.

P.3: Increase in regulation - harder to open mines. Better plans for mitigating impacts. → Reduction

P.4 : Impacts on Artisan/small sector.

Begin your answer for Question Three here:

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Sustainable mining does appear to be an oxymoron as it refers to removing a non-renewable mineral from the ground which is intrinsically an ~~last~~ unsustainable behaviour. However it can also refer to ensuring that no gaps of people or the environment is detrimentally affected because of mining.

CA

In the long term, it is likely that supply of minerals will begin to decrease. This is due to the fact that there is only a finite supply of minerals available for human consumption as they are a non-renewable resource. This, through the supply & demand principle will create increasingly high prices for minerals. Therefore, ~~so~~ ~~the~~ there will be more benefits than ever for anybody directly involved in the mining sector, as greater profits will stand to be made. When this occurs, these large companies of the formal mining sector may be able to look to better allocate their benefits, as they will have greater surplus of resources.

CA  
J

As time goes on, Western social values are increasingly expected on a global scale, e.g. human rights, equality etc and this trend is likely to occur into the future. It

is quite probable, as has occurred in the past, that legislation will be developed to ensure that mining does not detrimentally affect any groups. Such legislation has been developed in the past such as the UN Human rights, and this is in response to direct social pressure to ensure that their moral beliefs and standards and the quality of life are available on a worldwide scale and are enforced. Therefore, with ~~increas-~~ society's increasing desire for fair equality and opposition to poverty/poor treatment/unfairness in LEDCs, it is probably very probable that in the future large mining companies will have to justify all their actions, and ensure that their activities are only bringing benefits to local communities and the environment rather than costs. So, the future of the mining industry should be that mining companies have an increasing responsibility, not only to its investors, but also to other stakeholders to only act in the best interest of any stakeholder and not put more weighting on the interests of some to the detriment of interests of others. More programs, such as the ones that Barrick and De Beers have introduced will ~~be~~ become common place. Workers' rights and

Geography 93401, 2013 local communities e.g. Anthropocene viewpoint, it is likely that programs supporting communities will be supported before more extensive environmental

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R

wages will likely improve and discrepancies between the income of these groups <sup>and executives/staff</sup> is likely to diminish. These behaviours will be catalysed by the actions of the increasing profit to be made from minerals because of their decreasing demand <sup>as more money will be available to support these behaviours</sup>. Much of the current behaviour of mining companies, such as the pollution caused by the OK Tedi, ~~mine~~ will become unacceptable and more 'morally acceptable' behaviours adopted.

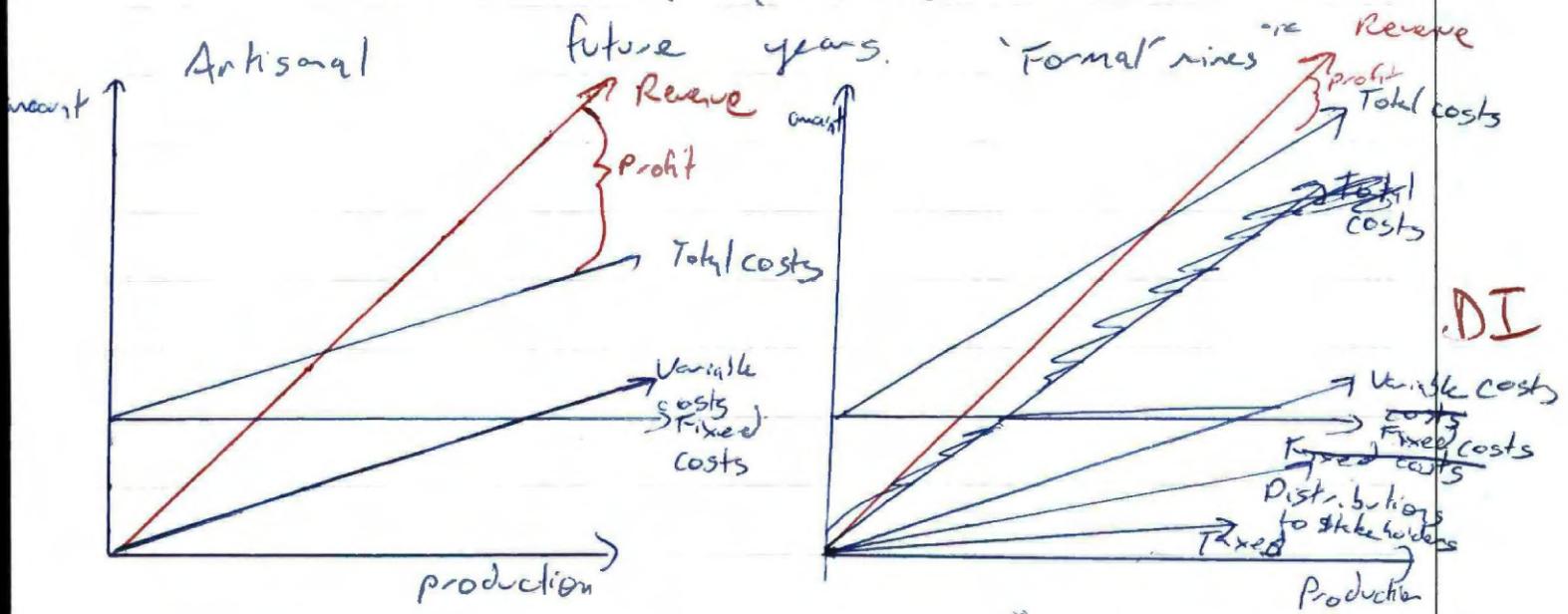
As a result of this ~~the~~ increase in ~~means~~ applying morals across the board, the mining industry may face much stricter regulations. Plans such as ones for rehabilitation of land, mitigating pollution and encouraging local growth will have to be developed, and all actions of a mine justified prior to being granted ~~access~~ <sup>the ability</sup> to open. This will be on the back of social pressure for equality and benefits of mining to be fairly distributed and so ~~federal~~ governments and ~~global~~ regulatory body's will put into place stricter regulations regarding the opening of mines. It is likely that the historical and intrinsic ~~last~~ value of land to indigenous people will be used to prevent opening mines in environments of cultural significance or ~~sustainability~~

environmental significance due to the mining sector's new found morality. This will apply to areas such as the Tarkine Wilderness in Tasmania, where recent proposals for land protection were rejected, however when future proposals such as the one made to protect the Tarkine wilderness, more weighting will be given to its intrinsic value rather than utility value. So a reduction in land available for mining is quite possible. Also with the stricter regulations an overall decrease in the number of mines globally <sup>may be observed</sup>, which will further act to increase regulation over the industry as regulation will be easier to enforce. However, the number of mining companies may just decrease, with each opening more mines.

However, in the unregulated Artisanal and small scale mining, ~~these~~ the impacts of the morality movement will not be nearly as great. Many more individuals may turn to this form of mining in order to generate a living as jobs in the ~~main~~ formal mining sector will quite probably decrease with the decrease in Mines/mining companies. It is also possible that in order to avoid regulation by organisations and global body's there may be an influx of illegal / small scale mines. ~~As~~ This will be especially apparent with capitalist individuals, who will see the opportunity for much larger profits when

other benefits to be gained from mining do not have to be distributed fairly to all stakeholders.

Figure 3A: Comparison of personal gain to be made from formal & Artisanal mines in



As these generalised graphs demonstrate, with the introduction of regulations & surrounding distributions to stakeholders (e.g. local communities & environment) and the taxes of the extra regulation provides, a much smaller personal profit is to be made for equity participants than of formal mines than of Artisanal. So more individuals, whose primary concern is making a profit, may turn to small scale / Artisanal mines for a larger personal gain for their investment. However, as the mining industry better drives economic development, and therefore development of LEDCs (where Artisanal mines are primarily located) Artisanal mines will begin to face enforcement of laws and therefore there will be an eventual drop in numbers after the initial boom.

QUESTION  
NUMBER

Extra space if required.  
Write the question number(s) if applicable.

2 continued. So therefore while most perspectives feel that all groups affected by mining should benefit in some ways in reality they may not all be able to, as so differing perspectives of differing groups place differing weightings on who should benefit from mining. //

A

QUESTION  
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Extra space if required.  
Write the question number(s) if applicable.

3 continued: So in summary, the future of the mining industry is set to better ensure that all stakeholders of the mining industry ~~are~~ CA benefit have greater and more fair benefit from their involvement. This will be a positive move and ensure that ~~that~~ J no stakeholders are detrimentally affected by mining (as the environment & local communities are now) ~~and~~ CA so will eventually lead to 'sustainable mining'

**Extra space if required.  
Write the question number(s) if applicable.**

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