

## Evidence of the Income Inequality Situation in the Mining Industry of Ghana

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### Abstract

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This paper reviews the trends and nature of income inequality in the mining industry of Ghana. One of the central challenges of our times: that of overcoming growing income inequalities in the mining industry in Ghana, but also the society in general. This trend, now well-recognized, is worrying not only for its economic impact, but as importantly because it threatens the very social fabric of our societies; creates fierce class warfare and threaten global peace and security. In fact, the increase in economic inequality contributes to the economic, social, political and ecological crises of today. The mining industry is characterized by rising levels of income inequality with few expatriates and management staff earning about two-thirds of the entire industry's wealth. In measuring the level of income inequality, the study used secondary data; pay roll data for its analysis. The study used 2015 salary data of 5204 employees based on their industrial gold output share in 2014, employee strength, presence of expatriate and the existence of a union in those companies. From the study, the top 10% of the entire staff population earned 49.79% of the overall basis salary while the bottom 10% also earned 3.1%.

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**Keywords:** Foreign Direct Investment, Shareholder Value, Indexation, Income Inequality.

### • Introduction

Income inequality is a key component of economic inequality and arguably the most talked about in the last decade. "The global inequality crisis is reaching new extremes. The richest 1% now have more wealth than the rest of the world combined. Power and privilege is being used to skew the economic system to increase the gap between the richest and the rest. A global network of tax havens further enables the richest individuals to hide \$7.6 trillion. The fight against poverty will not be won until the inequality crisis is tackled" (Oxfam 2016). The above quote is an abstract from an Oxfam's briefing paper presented to the World's Economic Forum early this year and provides chilling revelations of how global income inequality is hurting humanity. Similarly, the Ghanaian society and by extension, the mining industry, is gravely affected by this income inequality situation, with its attendant problems and challenges. Sadly, the income inequality narrative in the mining industry and its impact on tactical and operational workers has grown from bad to worse in the last decade.

In the early 80s, the period of the Economic Recovery Programme (ERP) in the mining industry, there was not much talk about income inequality in the mining sector. However, in the 90s when Foreign Direct Investment (FDI) peaked, it came with it an increased multinational presence in the mining industry of Ghana, thus provoking issues of income inequality. Indeed, this has generated lots of debate among stakeholders in the sector over the uneven sharing of mining outcomes. Concerns are wide spread and fast-growing among stakeholders over how the wealth generated from the mining sector has and continue to be distributed amongst its actors.

Ankrah (2015) noted that: Ghana started mining over 10 decades. Our peers in the developed countries rode on the back of mining receipts to develop their economies. Notable among these are the popular American, Australia and the South African examples.

Mining transformed the Californian economy drastically moving it from the most sparsely populated state in America to the most populous one in recent times mainly due to the foresight of successive leadership and the governance structure of the United States of America in ensuring that the economic fortunes of California was sustained beyond mining. Sadly, in Ghana the bulk of receipts from mining are repatriated back to the home countries of these multinational conglomerates. The little that is mobilized through taxes and royalties for the country can hardly be linked to specific social investment projects for the benefit of its citizenry. The income inequality situation therefore exists at both micro (sector) and macro (national) levels. Interestingly, the income inequality discourse in the mining industry over the years has attracted several viewpoints culminating in two very popular strands. While the first strand, the proponents of the income inequality, believes that income from mining is being unfairly distributed functionally between capital and labour and indeed, has demonstrated this assertion, considering how companies make super profits particularly, during periods of commodity price boom, yet labour continuous to receive a paltry share of what has always been generated.

A case in point, according to them, is the period between 2010 to 2013, a period described as a period of "commodity price boom" in the history of the sector. The proponents of the income inequality strand argued that even during this period of commodity price boom, labour received a paltry share of what has been generated over that period; and even with that, much of the wealth went to the privileged expatriates and managerial personnel in terms of personal distribution of income. On the contrary, advocates of the second strand, (however disagrees with this assertion) argues that the entire industry is growing together and gains are fairly distributed amongst the various stakeholders in relation to their contribution to wealth generation. Interestingly, the views of the second strand are supported by the concept of shareholder value, a capitalist logic fast-contributing to income inequality and worsening the plight of labour. Deductions from shareholder value analysis explains the reason why multinational companies are profit driven and as such they invest (1) dollar and expect to earn (7) times the amount. This notion about shareholder value and returns on investment according to Stiglitz (2012) compensation schemes in high wage sectors, were based on the ideology that money is the best motivator to bring about social returns. In the views of Stiglitz, two perspectives explain employer's approach in seeking gains within a local economy.

The first was stakeholder corporate governance system where management was controlled by all stakeholders including the unions, owners, creditors and the local community. Here stakeholders could not increase salaries beyond the normal increase of incomes. However, the system was short lived and replaced with shareholder value system which had led to exceedingly high salaries for top management, middle management and financial intermediaries. This paradigm shift from the former to the latter has strengthened the hands of management to devise strategies (including exploitative techniques) in order to keep incomes at the bottom perpetually low. Management will always secure the investment portfolio of the shareholders and neglect the plight of those contributing to productivity. Contrary to Stiglitz's assertion that investment is the best motivator to bring about social returns, it is instructive to highlight that though capital investment is a necessary condition for returns, without other factors of production, particularly labour, investment will be idle. Therefore, workers are very essential in the production chain of every organization and hence the need to be recognized and fairly compensated.

The concerns and the debate about incomes in the sector have lingered on for many years and at times heightened tensions among stakeholders, particularly between the Ghana Mineworkers' Union and the mining companies during negotiations of worker's conditions of employment. As the concerns of income inequality grow among the various categories of workers, incomes could stagnate and household consumption reduced, slipping workers into working poverty. Also, as inequality grows and impact on workers and the communities negatively, it can trigger class confrontation between communities and multinationals (most of which operate at the heart of these communities) with devastating consequences. It is therefore extremely important to subject these two contending opinions to empirical test in order to ascertain the veracity or otherwise of the income inequality situation so as to devise appropriate interventions to help sustainably address this development. In light of the above, the study will therefore provide a critical empirical angle to the whole discussion.

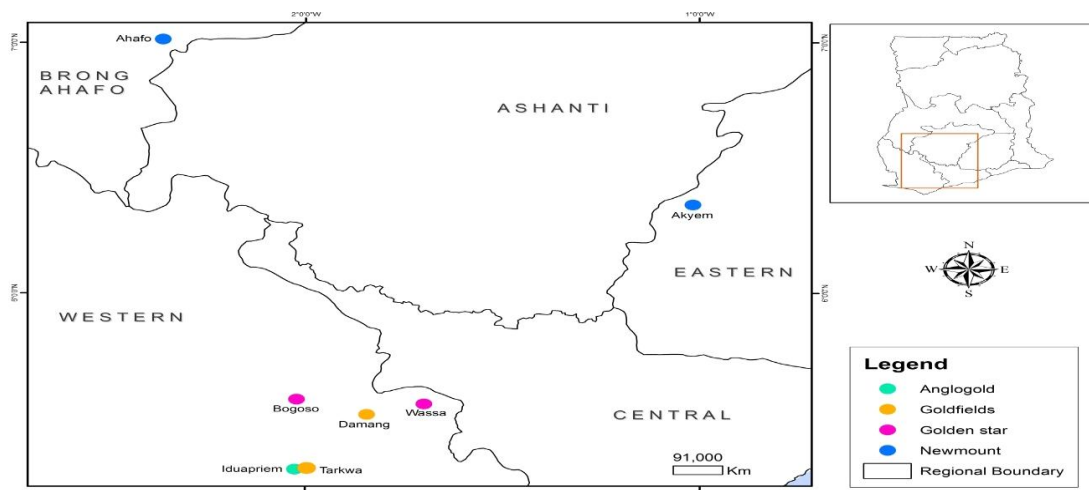
The outcome of the study will enable policy makers evaluate the threats posed by income inequality in the industry and also assist in the designing of interventions to minimize and completely eliminate this situation in the long run. Subsequent sections of this paper, discussed the conceptual approach that guided the study. These are followed by the discussion of the results, conclusions and policy implications.

## 2.0 Approach and Methods

The mining industry in Ghana is comprised of two broad operations; those who deal with direct production as well as trade on the international market; and those providing auxiliary support services to production companies. Gold is the major mineral exploited in the mining industry and contributes substantially to the industry's output in terms of mineral revenue and production. In view of that, the study concentrated much more on gold mining. The study sampled seven (7) operating mines, but for the purpose of convenience, and without compromising the outcome of the research, these areas were merged into four (4) specific companies as follows; AngloGold Ashanti (Iduapriem), Goldfields Ghana Ltd (Tarkwa & Damang), Newmont (Ahafo & Akyem) and Golden Star (Wassa & Bogoso). Majority of these companies were in a cluster with the exception of Newmont Ghana which is located in both the Eastern and Brong Ahafo Regions of Ghana. Goldfields (Tarkwa & Damang), Golden Star (Wassa & Bogoso) and AngloGold Iduapriem are all located in the Western Region of Ghana.

These 4-major gold producing companies in the industry were selected on the basis of their industrial gold output share in 2014, the employee strength, presence of expatriate and lastly the existence of union in those companies. Pay roll data of salaried workers was used as the basis for analysis and in all, 5204 workers made up of expatriate, management, senior and junior staff served as the unit for analysis. The study resorted to the Gini coefficient and Kruskal Wallis test analysis which measures the distribution of income with reference to the median. The non-parametric test option was chosen. Data analysis was done using Microsoft Excel, SPSS and STATA. The map below shows the selected mining areas used for analysis.

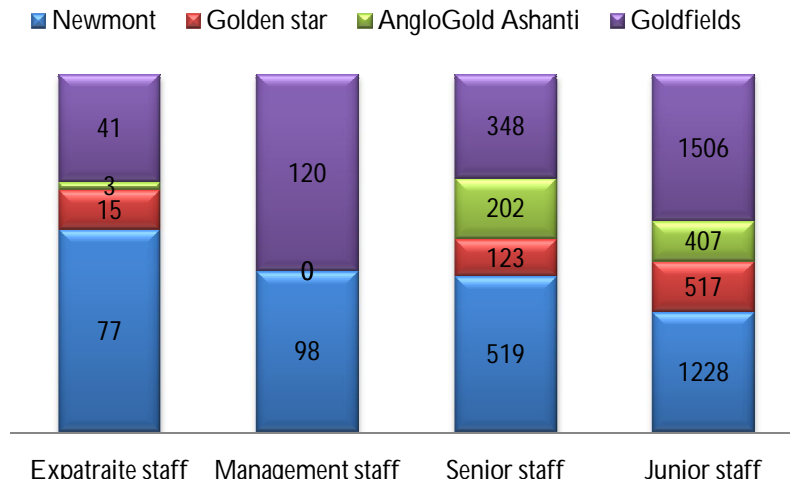
**Figure 1: Map of selected mining areas**



Source: Geography & Regional Planning, University of Cape Coast, 2016

## 3.0 Results and Discussion

Production in the mining industry is basically dependent on the strength of both employees and employers (management). Labour in the industry plays a major role in the entire cycle of output generation and profit gains of the industry. The study sampled 5204 workers from four different companies across the country. Majority of the workers (70%) were junior staff, 23% were senior staffs whereas expatriates and management constituted 3% and 4% respectively. The strength of senior and junior staffs towards the development of the industry is undisputed and as such a deeper gaze into issues of their welfare was essential. Figure 2, below presents the category of staff across the selected companies.

**Figure 2: Distribution of Staffs across Listed Companies**

The number of junior and senior staffs at Newmont and Goldfields were very high as compared to the other operating mines. Goldfields had the largest share of junior staff population of 1506 followed by Newmont Ghana Limited with 1228 staffs. Out of the 4 companies sampled, expatriate representation was nearly 3 percent. Newmont Ghana however recorded the highest number of 77 out of the total of 136 expatriate whilst Goldfields recorded the highest number of management staffs, 120 out of 218. Data on management was not readily available for Golden Star and AngloGold Ashanti (Iduapriem) hence was not included in the analysis of the study.

### 3.1 The realities of income inequality in the mining industry

From the study, the Gini coefficient for income distribution was 0.526 in 2015. This revealed that income distribution was skewed in favour of expatriate and management staff relative to the senior and junior staff, suggesting high level of marginalization of incomes of those at the bottom. The results from income analysis showed that, 1% increase in that income source (basic salary), all else being equal, increase the inequality gap by 0.0547%. Also, income was unequally distributed (0.526), and the Gini correlation between basic salary and total income was high (0.966), indicating that basic salary favours the expatriate and management staff more than the junior and senior staffs.

### 3.2 Income pattern across the staff category

One of the major concerns of Trade Unions have often been the issue of unfair distribution of income in the industry. Union preach equity in income distribution as employers have also challenged the ideology of income inequality. Mostly employers are of the view that the differences in incomes across employee category are statistically insignificant. In unraveling whether or not the viability of income difference among the staff category. In view of that a deeper review on the income distribution pattern among workers in the industry where a Kruskal-Wallis test was therefore employed to examine whether or not basic salary significantly differ across the various staff categories of the industry.

#### Following the Hypothesis

- : Basic salaries do not significantly differ across staff category
- : Basic salaries significantly differ across staff category

**Table 1: Income Distribution by Staff Category**

Income	Expatriate	Management	Senior	Junior
> Median	136	218	1188	1059
< = Median	0	0	4	2599
<b>Total</b>	<b>136</b>	<b>218</b>	<b>1192</b>	<b>3658</b>

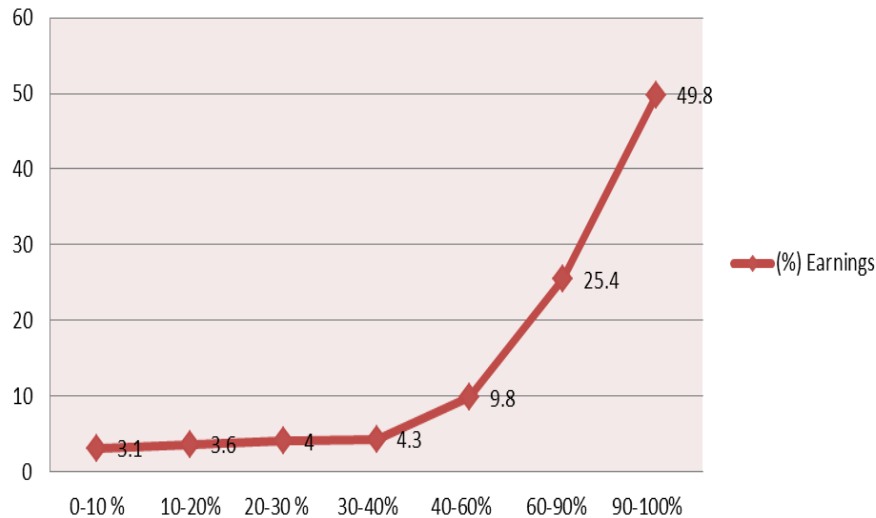
Median=2,544.00, =2178.386, df=3, =0.05, p-value =.000

Both expatriate and management staff earned salaries more than the average (median) of GH¢2,544.00 (US\$795). However, the outcome was different for senior and junior staff. In the case of the senior staff, 4 out of 1192 workers earned incomes less than the median amount. Also, majority of the junior staff (71%) earned below the median income. This shows how income distribution is lopsided in favour of expatriates and management staff relative to junior/senior staff. The median test showed that, incomes significantly differ across the staff category. This claim was valid under both 1 percent and 5 percent levels of significance.

**3.3 Income in the Hands of the Top 10%**

Indeed, some interest groups have over the years differed from the view point of Ghana Mineworkers’ Union on the issue of unfair income distribution in the industry. They argue that, the entire industry is growing together and gains are fairly distributed among the various stakeholders in relation to their contribution to wealth generation. The study therefore examined the claim by these interest groups to ascertain whether or not income is fairly distributed and also determine how much of the wealth is controlled by the different facets of the staff category. In doing so, the study employed a percentile share test to examine the share of total income earned by all categories of workers in the industry. The outcome showed that, the top 10percent of the population earned 49.8% of total income; the bottom 10% earn 3percent of total income. From the test, it was also revealed that 60% of workers predominantly junior and senior staff within the selected companies received 24.8% share of the total income. Figure 3 below present’s staff share of total income.

**Figure 3: Percentile share of total basic Salary (percent) Number of obs= 5204**



Considering the level of productive capacity of workers in the gold mining industry, if the top 40% are earning 75.2 percent and the bottom 60 percent are earning 24.8% of total income, then issues of wealth redistribution in the industry ought to be examined critically.

### 3.4 Top-Bottom Ratio Analysis within the Industry

The study again looked at the ratio of the highest earner to the lowest earner in the industry. Intercompany ratio analysis was also computed looking at the ratio of the least earner in each selected company to the highest earner in the industry. The highest paid in the industry receive **GHC180,066.90** (US\$56,270.90) while the least paid earnings vary from company to company. Table 2 presents the ratios of the minimum in each company to the highest in the industry.

**Table 2: Ratios between the Highest Paid and the Least Paid In the Industry**

Ratio Analysis	Highest/ Lowest
Overall Industry	<b>1:9.28</b>
Newmont	<b>1:9.21</b>
Goldfields	<b>1:7.92</b>
AngloGold Ashanti	<b>1:7.38</b>
Golden Star	<b>1:9.28</b>

The ratio of highest to least paid person in the industry was 1:9.28; this implies that, the least paid person in the industry must work for at least 9 years or 108 months to earn a month's basic salary of the highest paid person. At the intercompany level, the least paid person at Newmont must also work for nine (9) years to earn a month's salary of the highest paid person in the industry. Similarly, the least paid person at Goldfields must work for nearly 8 years to earn a month's basic salary of the highest paid person in the industry. The result for Golden star is the same as that of the industry since the lowest paid person in the industry is the lowest paid person in Golden star.

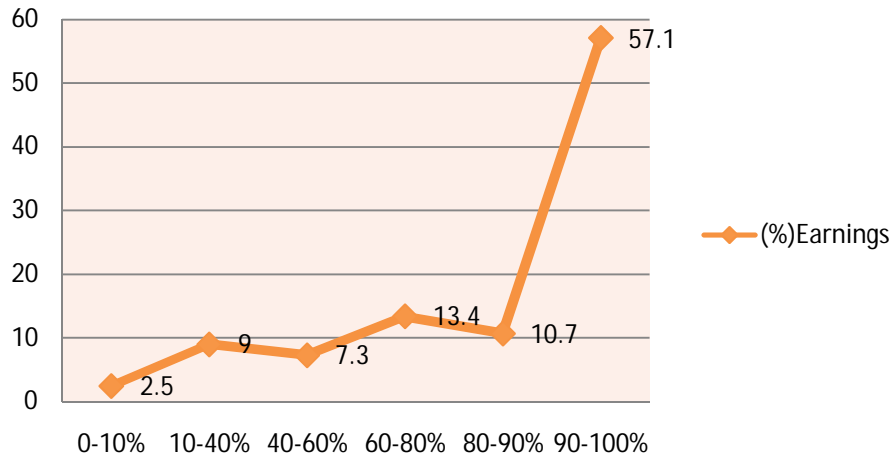
### 3.5 Intra-Company Analysis of Income Inequality

Newmont Ghana Limited recorded the highest Gini index of (.6057). The figure was more than the industry's index of (.526). Also, the highest paid person from Newmont Ghana Limited earned GHC180,066.90 (US\$56,270.90) while the least paid worker earned GHC1,628.80 (US\$509). Equally, the highest paid person in Goldfields Ghana Limited earned GHC169,050.00 (US\$52,828.13) whereas the lowest paid worker earned GHC1,895 (US\$592.19) Unlike Newmont where the highest paid person was an expatriate; the highest paid in Goldfields was a Ghanaian national. The Gini index for Goldfields Ghana Limited was (0.4806) with Golden star and AngloGold Ashanti having an index of (0.4381) and (0.3006) respectively. All these companies had a higher Gini correlation between the basic salary and the total income, indicating that basic salary favours those at the top more than junior and senior staffs.

#### 3.5.1 Newmont Ghana limited

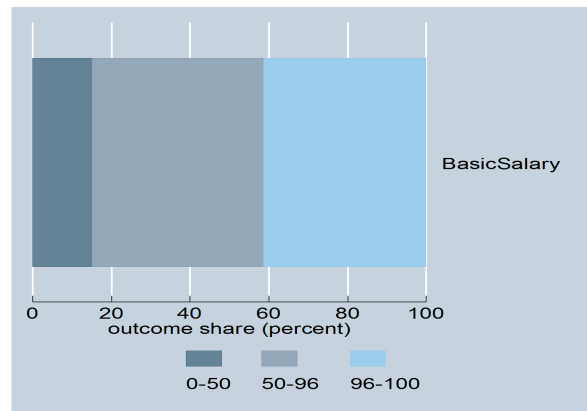
The study also examined the distribution of income at Newmont Ghana Limited. The inclusive motive was to assess the percentage share of the overall basic salary in the company. The claim by the proponents of fair distribution of income in the mining industry was again contested.

**Figure 4: Percentile share of total basic Salary (percent) Number of obs = 1922**



From the results, 60% of the population who were largely junior staff received only 18.8% of the entire monthly income of staff at Newmont Ghana limited. It further reveals that, 10% of the top staff, predominantly management and expatriate earned 57.1 percent of the overall staff basic salary while 10% of the bottom staff earned 2.5 percent of the overall staff basic salary.

**Earnings of 77 expatriates who represents the top 4% at Newmont Ghana Limited**

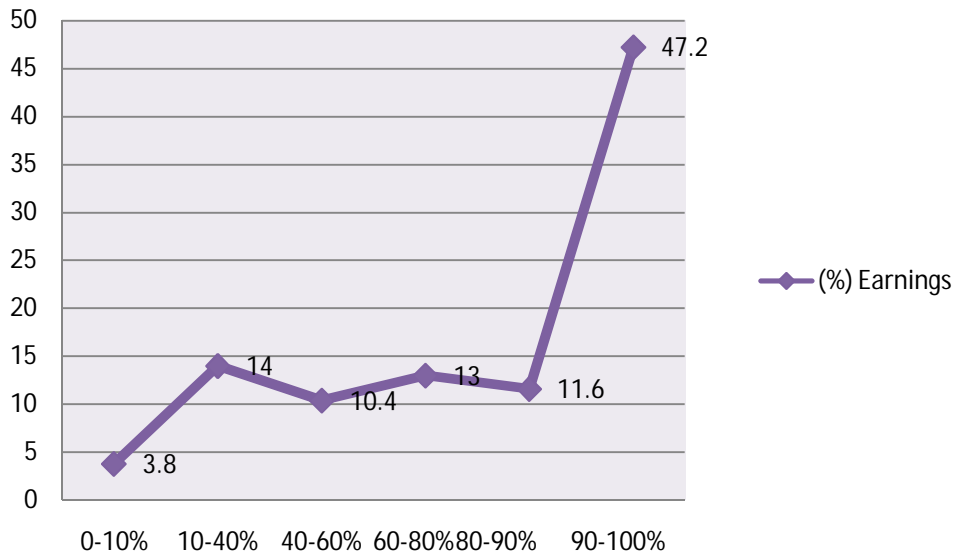


The top 4% staffs (77 expatriates) out of the total 1922 staff population at Newmont earned 41% of the total income of workers in Newmont. The result shows clearly that some majority of junior staff and senior staff were being marginalized. Inversely, majority of the staff (96%) with varying skill deposits such as geologist; engineers and many others were receiving nearly 59% of the total income share.

**3.5.2 Goldfields Ghana Limited**

Goldfields Ghana Limited recorded the highest number of staff studied. The company also had the largest number of junior staff. In assessing issues of income inequality, one cannot disregard the issues of who gets what (distribution). Income distributional analysis was then performed using percentile share estimate. Figure 5 presents the share of income in the company.

**Figure 5: Percentile shares (percent) Number of obs = 2015**

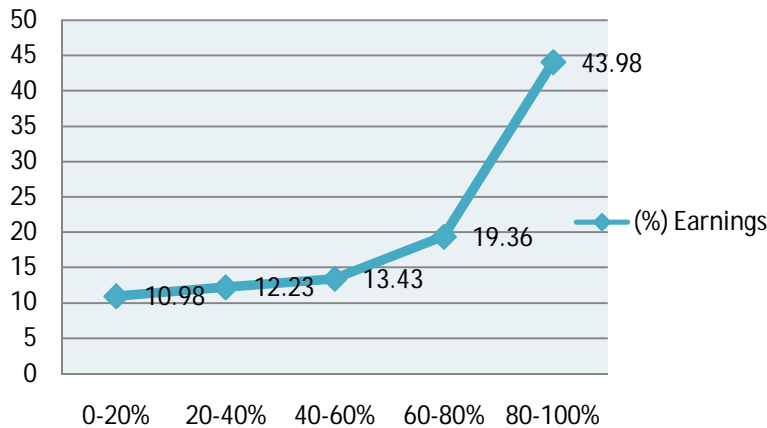


From Figure 5, the bottom 90% of staff (junior and senior) earned 52.8% of total basic salary whereas the top 10%, predominantly expatriates and management earned 47.2 percent of the overall income share. Therefore, a few people at the top earned comparatively a higher share of the total income.

**3.5.3 AngloGold Ashanti (Iduapriem)**

A percentile share estimate of the income distribution revealed that, the top 20% of the population earned 43.98 percent of the overall income at AngloGold Ashanti. On the other hand, the bottom 80% of the population earned 56.02% of the entire monthly salary of the company

**Figure 6: Percentile share of basic salary (percent) Number of obs= 612**



Comparatively, the bottom 40% of staffs at AngloGold earned slightly higher than the bottom 40% of the other gold producing companies listed. Junior staffs at AngloGold Ashanti earned 1% more than their counterparts in the other companies. However, the bulk of earnings at AngloGold were largely skewed towards the top labour lords. As discussed in the initial portions of the study, junior staff population by far exceed the entire staff category therefore, if their plight is not taking into consideration, it would have negative impact on the overall operations of companies.

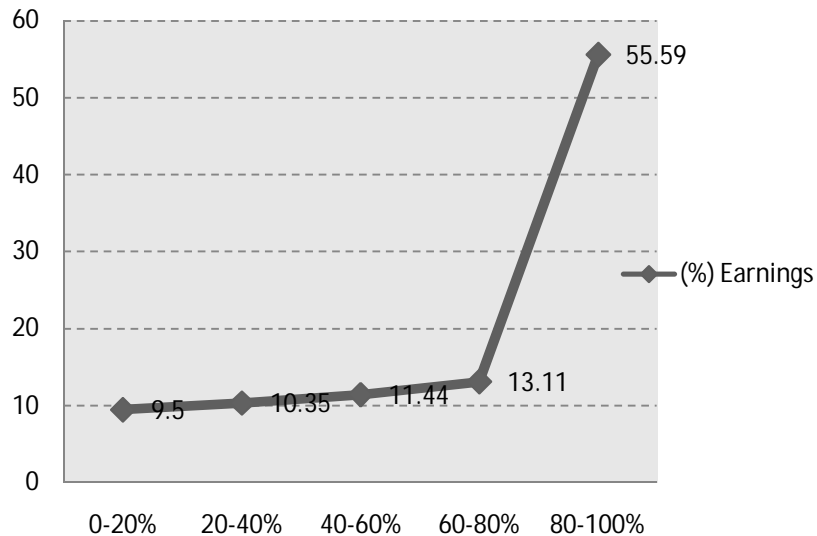
**3.5.4 Golden star (Wassa & Bogoso)**

The study again disaggregated the salary data for Golden star to be able to examine the percentile share of income distribution in the company.



A total of 655 salary data was attained from this company. Staff category was made of 517 junior staffs, 123 senior staffs and 15 expatriate. There was no information attained on management's basic salary. Figure 7 presents a percentile share analysis.

**Figure 7: Percentile share of basic salary (percent) Number of obs= 655**



The study revealed that, the top 20% of staffs earned 56% of the total income share of the entire staff population. On the other hand, the bottom 80% also earned 44.4% of the total income. Surprisingly, the bottom 40% earn less than 20% of the total income and this is a clear evidence of how income is lopsided in favour of a few privileged expatriate.

### 3.5.5 Income Inequality and Skills Flight

Recent survey by Info Mines suggests that Africa is the 3<sup>rd</sup> continent that pays low for its skilled labour compared to Australia, Canada and other developed economies. The issues of wage gap between expatriate and local is increasingly becoming a problem across the globe and this as a result, leads to emigration of skilled workers from their home countries to other parts of the globe in search of better working conditions. From the HAYS report (2013), Ghanaian locals only make US\$39,200 compared with their expatriate counterparts' share of US\$152,100, representing 25.77% or a quarter of what the expatriate earns. Interestingly, while a Ghanaian local earns 25.77% of its expatriate counterpart, countries such as South Africa, Burkinaso Faso, Namibia and Congo DR within the same continent earn 50% of what their expatriate counterparts earn, which is quite remarkable. Considering the fluidity of skills and the extent of disparity in incomes exposed, the tendency for one to move across borders in search of competitive salaries knowing they could earn more in another country is very high. In Ghana, this phenomenon is increasingly gaining grounds as supported by (Ankra,2015). The effect of expatriation is not entirely negative but could have positive consequences on the remuneration landscape of an economy and an avenue for experience sharing.

Within the context of intra company discourse, the income inequality gap between expatriate/locals is worsening. Worthy of note from the study were two major companies whose expatriate /local ratio had been criticized in recent times by the Ghana Mineworkers' Union. Newmont is one of the companies, with very striking revelations of a widening expatriate/ local ratio. From the analysis, the company's ratio stood at (1:110.55) meaning that, it would take the lowest paid person 110 months or at least 9years to earn the income of the highest paid person. Similarly, Goldfield's expatriate /local ratio was (1:71.9) meaning that it would take the least paid person 71 months or almost 6 years to earn the income of the highest paid person in the company.

Another point of interest is the salary relativity between the highest paid in Goldfields to some critical and scarce mining skills. From the analysis, the ratio of highest paid to a geologist is (1:26), a senior engineer (1:22) and a senior surveyor (1:31). This means that a geologist, senior engineer and a senior surveyor are expected to work for 26, 22 and 31 months respectively to be able to earn a month's salary of the highest paid. From the above deduction, it is not surprising that most of the key mining skills in Ghana seize the slightest opportunity to secure better offers in other mining economies and join the cream of well-paid colleagues in these countries mentioned above.

### Key Findings

- The Gini coefficient for income distribution in the Ghanaian mining industry stood at (0.526) in 2015. Also, the Gini correlation between basic salary and total income was very high (0.966), indicating that, basic salary favours the expatriate and management staff more than senior and junior staff.
- The study revealed that income distribution was lopsided in favour of those at the top and that majority of junior staff were marginalized in terms of their total emolument share.
- From the study, the top 10 percent of the entire staff population earned 49.79% of the overall basis salary; the bottom 10% also earned 3.1%.
- Also, majority of the junior staff (71%) earned below the median basic salary of the industry. However, all expatriate and management staff earn an income above an average (median) of GHC2,544.00 (\$653.98).
- Newmont Ghana recorded the highest Gini coefficient of 0.6057, slightly above the industry's Gini coefficient of 0.526. Goldfields and Golden star also recorded a Gini Coefficient above 0.40 while AngloGold recorded the least Gini Coefficient of 0.301. All these companies however, recorded a high Gini correlation between the basic salary and total income.
- From the results, 60% of junior staff at Newmont Ghana Limited received only 18.74% of the entire monthly basic salary of staffs. However, 10% of the top staffs earned 57.09 percent of the overall basic salary. Surprisingly, 4% of expatriates earned 41% of the total basic salary as the bottom (96%) of staff with varying skill deposits such as the geologist; engineer and many others were receiving nearly 59% of the total income share at Newmont.
- The study also revealed that, the top 10% of staff (expatriate and management) at Goldfields Ghana earned (47.2%) the overall basic salary. However, the bottom 90% junior and senior staffs earned 52.8% of the overall basic salary.
- From the study, the top 20% of the population earned 43.98 percent of the monthly emolument of AngloGold Ashanti (Iduapriem). On the other hand, the bottom 80% of the population earned 56.02% of the entire monthly salary of the company.
- The study revealed that, the top 20% of staff earned 55% of the total basic salary of the entire staff population. On the other hand, the bottom 80% staff (blue colour employees and other professionals; geologist and engineer) also earned 45% of the total basic salary at Golden star.

### 4.0 Conclusion and Policy Recommendations

Generally, the study unveiled the nature of income inequality within the mining industry. From the results, the Gini index in 2015 clearly revealed the gap in income distribution. Companies such as Newmont and Goldfields recorded higher income inequality index. Also, the study revealed that, staffs with scarce mining skills earned lower incomes compared to their counterparts across the globe. Empirically, income distribution was generally lopsided in favour of those at the top compared to junior and senior staffs (belonging to the professional class). It is however instructive to note that the Union through the collective bargaining process and its campaigns have assisted to a large extent in reducing the inequality gap by 0.1039, from a Gini index of 0.63 in 2013. Even though some modest gains have been made in bridging the inequality gap, the future still looks quite bleak in comparison to both the local and global situations. Drawing from the analysis and findings of the study, the debate is, do we need to use union pressure to compel the mining companies to pay what will lead to skills retention in Ghana with its attendant revenue stream by way of PAYE into the national coffers? The answer is obviously Yes because such prompting debates are not meant for the faint hearted and docile trade union organization. It requires well thought-out research underpinned by other internal sources of information to challenge the status quo.

There is therefore the urgent need for the appropriate interventions to be made in order to change this gloomy narrative, if not, we risk as a country of losing our mining skills to neighboring economies that are committed to appropriately compensating these skills in line with global skill prices. Additionally, this situation has the potential to encourage the influx of expatriates and increase repatriation of mining receipts, thus denying Ghana of its revenue from mining. It is therefore extremely important to pay serious attention to initiatives that will ensure income redistribution in the mining industry and guarantee fair and equitable distribution of incomes for all in the long run.

To this end, the study recommends the following for immediate attention and intervention by policymakers:

- Establish an income earnings model with clear timelines to address the inequality gap on a sustainable base, using the collective bargaining platform
- Introduce and support employee/union representation on Company boards in order to secure codetermination rights and ensure participatory decision making.
- Align expatriate-local skills transfer policies with expatriate-local remuneration/compensation policies.
- Critically evaluate Ghanaian mining skills and compensate in-line with global best practices since mining skills are portable and flexible.

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## Appendix

Table 5: Percentile Share of Basic Salary (Percent)

Basic Salary	Coefficient	Std. Err	(95% Conf. interval)	
Overall Industry N= 5204				
0-10	3.10	.089	2.93	3.27
10-20	3.63	.102	3.43	3.83
20-30	4.01	.112	3.79	4.24
30-40	4.33	.120	4.09	4.56
40-60	9.74	.265	9.21	10.25
60-90	25.38	.60046	24.20	26.55
<b>90-100</b>	<b>49.79</b>	<b>1.235</b>	<b>47.374</b>	<b>52.22</b>
Newmont N= 1922				
0-10	2.52	.12	2.27	2.77
10-40	8.97	.43	8.11	9.82
40-60	7.26	.34	6.58	7.94
60-80	13.40	.61	12.19	14.61
80-90	10.74	.39	9.97	11.51
<b>90-100</b>	<b>57.09</b>	<b>1.76</b>	<b>53.62</b>	<b>60.56</b>
Goldfields N=2015				
0-10	3.78	.16	3.46	1.96
10-40	13.99	.59	12.83	15.16
40-60	10.41	.43	9.54	11.26
60-80	12.95	.51	11.92	13.92
80-90	11.59	.39	10.81	12.37
<b>90-100</b>	<b>47.28</b>	<b>1.98</b>	<b>43.40</b>	<b>51.17</b>
AngloGold N= 612				
0-20	10.98	.51	9.98	11.98
20-40	12.23	.56	11.13	13.32
40-60	13.43	.59	12.27	14.58
60-80	19.36	.93	17.54	21.18
<b>80-100</b>	<b>43.98</b>	<b>2.27</b>	<b>39.52</b>	<b>48.45</b>
Golden Star N=655				
0-20	9.5	.71	8.10	11.89
20-40	10.35	.76	8.83	11.85
40-60	11.44	.83	9.79	13.08
60-80	13.11	.88	11.37	14.85
<b>80-100</b>	<b>55.59</b>	<b>3.10</b>	<b>49.48</b>	<b>61.70</b>