ECONOMIC BENEFITS ASSOCIATED WITH MINERAL PRODUCTION IN GHANA

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ABSTRACT

Ghana is endowed with many natural resources which have contributed significantly to the nation's economic development. In this study, the economic benefits of Gold, Diamond, Bauxite and Manganese in terms of production, revenue from export as well as contributions to government revenue in the form of taxes between the years 1990 to 2011 and their projections from 2012 to 2030 were analysed and compared. Data was collected from Ghana Chamber of Mines, Ghana Mineral Commission, Bank of Ghana, Environmental Protection Agency and other relevant institutions combined with secondary related materials. Statistica software was used for the data analysis where a liner regression models were developed to describe the trend of the various minerals economic benefits. The immense benefit that comes with mining will continue if the state improves on policies of less mined minerals and implement prudent economic policies. Effective monitoring of regulatory institutions linked with the sector for implementing environmental policies and adoption of international standards of mining would help to prevent negative pressure from anti mining institutions.

Keywords: Corporate Social Responsibility; Economic Recovery Programme; Mining; Royalties; Corporate tax.

INTRODUCTION:

Mining in Ghana is one of the lucrative sectors for employees, governments as well as employers in so many ways. The mining industry is actually a huge contributor to Ghana Revenue Authority (GRA) through various forms as; employee income tax, payments of mineral royalties, corporate taxes and other levies (Ghana Chamber of Mines, 2012). The mining sector contributes about 12% of state revenue, 41% of the nation's total export earnings and 7% of country's total corporate gains (Aryee, Aboagye, 2008). Total royalty paid to government by mining companies in 2005 was estimated at US $ 26.76 million, later appreciated to US $ 38.46 million and US $53.80 in 2006 and 2007 respectively. The mining sector contributed 6.44 per cent of the state's Gross Domestic Product (GDP) with labor force of 17,500 (Boon, Ababio, 2009). Mining companies in Ghana play significant role in development of communities but these contributions from the sector are yet to be seen by the public as significant factor to the development of the country.

During the 14th to 19th Centuries, the then Gold Coast now Ghana, manufactured about 14 million ounces of gold with the use of traditional tools and methods. The British in the 19th Century pave the way for modern technologies after they took over the Ashanti Kingdom (Ayensu, 1997). In other to limit or eradicate this bad perception, companies have to implement various developmental projects or corporate social responsibilities within and outside their catchments. Based on the understanding of contributions of companies towards their communities and nations from various literatures can be described by the writer as "voluntarily contribution of corporate entities without duress from groups or group of persons, pressure groups, communities or governments. It is solely based on moral justice to win support from internal and external environments in which organization operates since there are no laws to enforce companies to contribute towards their communities or state in which they mined. On the part of industries, it has corporate reasons of contributing to both communities and the state. The purpose is to gain competitive advantage over others in addition to maintaining and receiving stable working environment. Companies enjoy good reputation from the public as a result of corporate social responsibility (Frynas, 2005).

Ghana also produces other minerals as aluminum metal and manganese ore, bauxite, diamond and other minerals such as kaolin, limestone, salt, sand, gravel, etc. In fulfillment of development, the Provisional National Defense Council (PNDC) launched a neo-liberal Economic Recovery Program (ERP)/Structural Adjustment Program (SAP) in 1983 which resulted in increased in gold mining. The reform of mineral legislatures in 1986 generated benefit for investors, communities and state. Legalization of operations of small-scale miners was not done until 1986, after the passage of the law for small-scale mining (PNDCL 218) (Akabzaa, Darimani, 2001).

The review led to World Bank group in 1990's fighting for Africa's natural resources granted US$ 2.75 billion loans to private multinational companies for investment into the extractive industry in Ghana (Pegg, 2003). In effect, companies put up sustainable developmental projects to contribute and reduce poverty in locations and the entire nation at large. Ghana Statistical Service established that since the poverty rate is said to be reducing, the level of poverty for those who are still poor has not transformed (GSS, 2007). To achieve these goals of poverty reduction and increase standard of living in communities, several strategic decisions have been adopted by mining companies. Goldfield Ghana decided to contribute US $ 1 for every ounce of gold produced in addition to 0.5 per cent of pre-tax profits. AngloGold Ashanti has been fighting against malaria with its program namely Obuasi Malaria Control Program (Anaman, 2008). In 2010, Yankson identified total employment level of Wassa West District in 1960s as 12 per cent within Tarkwa Township but appreciated to 14 per cent in 2000 as a result of these sustainable developmental contributions of mining companies. (Yankson, 2010). Mining companies provide social interventions in the country in different ways. These companies build schools; provide electricity and information technologies for communities and schools and also provide potable drinking water since their operation in one way or the other pollutes rivers. These projects include aquaculture, production of batik tie-and-dye, rearing of animals and crop cultivation. (Mitchell, 1999; Cottrell,Rankin 2000; Hilson, Murck ,2001). Gold Field Ghana Limited foundation also instituted a program called Sustainable Community Empowerment and Economic Development Program (SEED) in 2005 at a cost of US$ 5 million within Tarkwa and Abosso mining leases of the

company which consists of 16 villages around its operation as a five year program. The purpose of SEED is "to be a high impact, result focused sustainable and integrated community development program that focuses on economic growth, wealth creation, quality of life improvement, and empowerment through education, capacity building and infrastructure development which can be replicated in mine affected communities all over the world"(GFG,2005).

Newmont Ghana Gold Limited paid little more than US $47 million to the government as her last quarter payment in 2011. This amount consists of US $39 million for Corporate Income Tax, National Fiscal Stabilization Levy of US $6 million and US $2million of Mineral Royalties for September in that year. (Business and Financial Times, 2011). The Ghana Chamber of Mines implemented lot of projects and program in 2011 with the purpose of improving the socio-economic lives of people in mining communities. These programs implemented are Sustainable Livelihood, Educational Bursary Scheme, Infrastructure projects and Donations. Youths in these communities had a pilot apprenticeship training skills in Heavy Duty Machine Operations, Welding and Fabrication, Auto Mechanics and Hairdressing were some of sustainable livelihood programs (Business and Financial Times, 2011). To sum up total contributions towards communities in 2011 by Ghana Chamber of mines amounted to US$ 177,117 (Gh¢ 345,821.09).

Gold Fields Ghana Limited, one of the biggest mining company in the country through its foundation in collaboration with Ghana Health Service constructed a community clinic and nurses quarters for the people of Damang and its neighboring communities which was commission in 2012.An amount of US$ 190,822.94 was invested in the project via Gold Field Ghana Sustainable Community Empowerment and Economic Development Program, (SEED).Total amount of US $2.8 million has been invested in Damang Community development since the establishment of the Gold Fields Ghana Foundation in 2005.

(Ghana Chamber of Mines, 2012). The objective of this article was to analyze the economic benefits associated with mineral production in Ghana.

STUDY AREA AND METHODOLOGY:

Ghana is endowed with many natural resources and is located on the Western corridor of Africa with population of 25 million (GSS, 2010). It's between Ivory Coast and Togo on West and East respectively with Burkina Faso on the North whilst south is Gulf of Guinea. Ghana is the 10^{th} largest gold producer in the world and second in Africa after South Africa. Total mining activities both large-scale and small-scale in Ghana covers an area of 31,273 km^2 including others covered about 40% of total land (Chamber of Mines, 2006). In 2010, the sector grew by 10.4% which was huge contributor to revenue of Ghana Government (African Economic Outlook, 2011). The composition of the economy of Ghana is based on three sectors. In 2011, the agriculture sector provided 28.6%, industry 25.9% and finally service 48.5% with per capita income of US $ 3,257 (IMF, 2011). Data was collected from Ghana Chamber of Mines, Ghana Mineral Commission, Bank of Ghana, Environmental Protection Agency and other relevant institutions combined with secondary related materials. Statistica software was used to analyze data collected and developed regression model to determine quantum of economic benefit generated as well as quantities of Gold, Diamond, Bauxite and Manganese minerals extracted after the ERP/SAP.

RESULTS AND DISCUSSION:

Regression models were developed for Gold, Diamond, Bauxite and Manganese in relation to their production, revenue from export as well as contributions to government revenue in the form of taxes. Quantities of minerals extracted in 2011 amounted to 3,604.50 million (Oz) of Gold, 283,369 carats of Diamond, 407,918 (MT) of Bauxite and 1,705.31 million (MT) of manganese. In the same year, these minerals amounted to US$ 4,912.85 million, US$18.86 million, US$7.09 million and US$97.74 million as revenue generated into the economy respectively. These minerals represented 49% and 40% of total export in 2010 and 2011 accordingly whilst Gold represented 39% and others amounted to 1% of total exported revenue from minerals in 2011. The mining sector in Ghana has boosted its portion in Foreign Direct Investment (FDI) inflows into the economy. The government budget or expenditure is hugely

supported by contributions from mining sector. Corporate taxes, royalty payments, Pay As You Earn (P.A.Y.E) and other miscellaneous contributions amounted to 28.4% which is over US$ 1.9 billion (GH¢3.7billion) as total revenue earned in 2011 from the industry as their obligations as shown in tables 1-3. This makes the sector significant contributor to nation's development. Graphical representations of actual minerals produced, minerals revenue and taxes collected from mining companies with predicted trend from the year 2012 to 2030 as shown in Figs. 1 – 4. This shows significant relationship between these minerals Gold (Oz), Diamond (Carat), Bauxite (MT) and Manganese (MT) and year with exception of diamond which has insignificant relationship. The revenue from Gold, Diamond, Bauxite and Manganese were also predicted for the same years showing an upward trend of contribution and relationship between revenue and year in exception of diamond. Actual and future trend of revenue to government in the form of taxes were represented graphically too. There was a relationship between year and taxes contributed to government revenue. These parameters are significant contributors and the model can be depended on for prediction if all factors remain the same which will have immense contribution to development of the economy.

Gold (Oz), Manganese (MT) and Bauxite (MT) productions were significant at 0.05 as shown in table 4. The model was developed to identify trend of production for the past years which can be used for projection. The model revealed reliability of mineral productions that can be depended upon to predict future situations if all prevailing factors remain constant. However, Bauxite (MT) with correlation efficiency of 50% cannot be totally relied on since a shift in current or prevailing factors (i.e. capital investment, labor, etc.) either negatively or positively can have effect on the production trend. With respect to diamond (Carat), do not reveal relationship with production since p-value is > 0.05 and R^2 value is not significant which is negligible and represented by dash in tables number above. It has no relationship with year and totally insignificant therefore it was excluded from the statistical table. Export revenue data was used to develop regression model as shown in table 5. Gold, Manganese and Bauxite are significant revenue generators to the development of economy with R^2 values of 0.63, 0.68 and 0.26 respectively whilst bauxite seems to be least contributor with correlation efficiency of 50%. Reliability of bauxite model cannot be depended on entirely for projection; nevertheless, these minerals are significant in developing the economy of Ghana. With respect to revenue earned from diamond, the value for R^2 was < 1 and negligible with insignificant p – value and has no correlation with year and export revenue therefore it was exempted from the statistical analysis table.

Contributors to government revenue in terms of corporate tax, mineral royalties and pay as you earn (P.A.Y.E) taxes. These taxes are significant to government budget since p value is < 0.05 with respect to dependent (year) and total revenue contributed to government as shown in table 6 as contributions to government revenue. Corporate Tax, minerals royalties and P.A.Y.E value correlation efficiencies of 57%, 74% and 73% respectively. The model can be depended on for prediction of future trend with little attention on corporate tax model.

CONCLUSION:

Gold, bauxite and manganese are significant contributors to the revenue of the economic development of Ghana. Corporate taxes, royalty payments. P.A.Y.E and other miscellaneous contributed over 28 % of total revenue generated in 2011. The statistical analysis revealed that diamond production and revenue is not significant compared to other minerals and diamond output is negligible in terms of its contribution to the economy whilst other minerals are significant contributors to government revenue (e.g. taxes and exports). The government must provide special incentives such as tax reliefs, governmental support in the form of polices to diamond investors both locally and internationally which would encourage production and generate more revenue. Future analysis would consider the perception of Ghanaians in the sector as to gains and losses which would be compared with the result of this study.

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Table 1: Production of major minerals in Ghana

Year	Gold(Oz)' 000	Diamond(Carats)' 000	Bauxite(MT)'000	Manganese(MT)' 000
1990	541.15	636.50	368.66	246.87
1991	847.56	687.74	324.31	311.82
1992	1004.63	656.42	399.16	276.02
1993	1261.89	590.84	364.64	295.30
1994	1438.48	746.80	451.80	238.54
1995	1715.87	631.71	530.39	187.55
1996	1583.83	714.74	383.37	266.77
1997	1752.45	829.52	536.72	332.70
1998	2371.11	822.56	341.12	384.46
1999	2608.10	681.58	355.26	638.94
2000	2457.15	878.01	503.83	895.75
2001	2381.35	1090.07	678.45	1076.67
2002	2236.83	963.49	683.65	1135.83
2003	2274.63	904.09	494.72	1509.43
2004	2031.97	905.34	498.06	1597.09
2005	2138.94	1065.92	606.70	1719.59
2006	2337.78	972.99	972.99	1699.55
2007	2628.29	836.49	1033.37	1305.81
2008	2796.96	599.01	574.39	1261.00
2009	3119.83	354.44	420.48	1007.01
2010	3391.59	308.68	595.09	1564.63
2011	3604.50	283.37	407.92	1705.31

Source: Ghana Minerals Commission, 2012.

Table 2.Revenue from Gold, Diamond, Bauxite and Manganese

Year	Gold(US$) Million	Diamond(US$) Million	Bauxite(US$) Million	Manganese(US$) Million
1990	201.60	16.50	10.00	14.20
1991	304.40	18.60	8.60	20.20
1992	343.40	19.30	9.50	16.50
1993	434.00	17.30	8.40	13.90
1994	548.60	20.40	9.60	9.60
1995	647.30	14.80	10.40	6.40
1996	612.40	13.40	8.40	7.10
1997	579.23	11.31	10.79	11.55
1998	687.76	10.62	7.37	12.06
1999	710.82	8.95	7.62	21.72
2000	702.03	11.82	13.10	29.00
2001	617.84	20.50	16.38	36.66
2002	689.08	21.06	15.14	28.62
2003	830.13	23.37	11.01	29.04
2004	840.21	26.39	8.72	29.22
2005	945.82	35.66	16.00	37.28
2006	1367.00	31.28	22.60	40.65
2007	1733.78	28.97	18.88	32.84
2008	2246.00	25.00	22.00	52.97
2009	2551.37	7.34	11.08	49.11
2010	3803.52	11.31	15.15	58.21
2011	4912.85	18.86	7.09	97.74

Source: Bank of Ghana, 2012.

Table 3.Mining contribution to Government Revenue

YEAR	MINERAL ROYALTIES (GH¢)'000	P.A.Y.E(GH¢)'000	CORPORATE TAX (GH¢)'000
1990	189.34	90.75	282.59
1991	302.13	138.75	82.18
1992	454.58	177.15	455.51
1993	748.51	264.93	439.35
1994	1278.37	481.08	721.41
1995	2091.19	795.18	2039.30
1996	3552.70	1683.45	916.05
1997	3459.50	2502.20	986.88
1998	4984.12	3101.65	1445.08
1999	4862.04	2783.93	3111.71
2000	11873.69	5924.38	1578.92
2001	12735.84	7611.17	2481.29
2002	15345.25	10145.77	2350.12
2003	19438.76	14104.95	6813.77
2004	21574.37	13435.77	10033.11
2005	23595.19	15437.13	26988.96
2006	31625.48	18271.01	21566.21
2007	40882.04	34587.60	47415.69
2008	59006.51	47139.24	73554.70
2009	90415.90	103061.99	124600.88
2010	144697.35	132469.35	241578.78
2011	222024.71	178037.08	649902.54

Source: Ghana Mineral Commission, 2012.Pay As You Earn =P.A.Y.E, GH¢=Ghana Cedis

Table 4.Statistical analysis of minerals production

Parameters	Equation	R^2	F - value	P - value
Gold (Oz)	113x - 222945	0.85	109	<0.05
Bauxite (MT)	14.4x - 28364.2	0.25	7	<0.05
Manganese (MT)	80x - 158460	0.77	72	<0.05

x = Year

Table 5.Statistical analysis of minerals revenue

Parameters	Equation	R^2	F - value	P - value
Gold (Oz)	146x - 291197	0.63	34	<0.05
Bauxite (MT)	0.365x - 718.658	0.26	7	<0.05
Manganese (MT)	2.71x - 5397.23	0.68	43	<0.05

x = Year

Table 6.Statistical analysis of contribution to Government revenue

Parameters	Equation	R^2	F - value	P - value
Corporate Tax	12752x - 25453964	0.33	10	<0.05
Mineral Royalties	6243x - 12457076	0.54	24	<0.05
P.A.Y.E	5431x - 10837497	0.54	23	<0.05

x = Year, Pay As You Earn = P.A.Y.E.

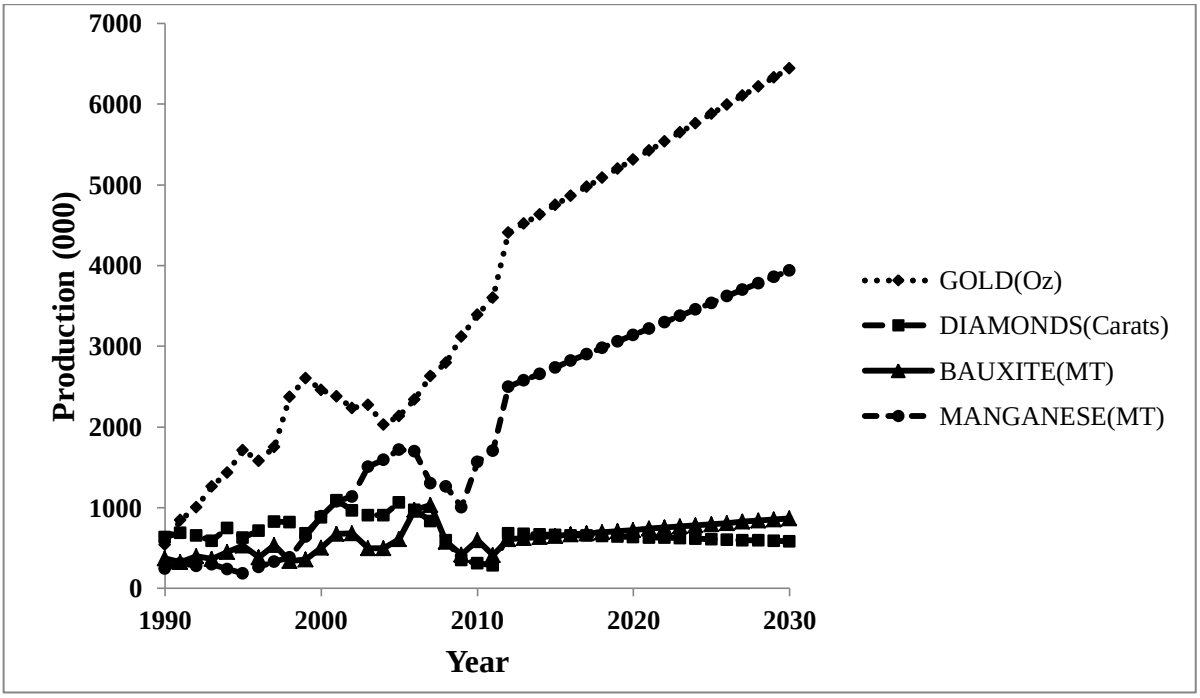

Fig 1. Relationship between production and year in relation to major minerals and projections between 2012 to 2030.

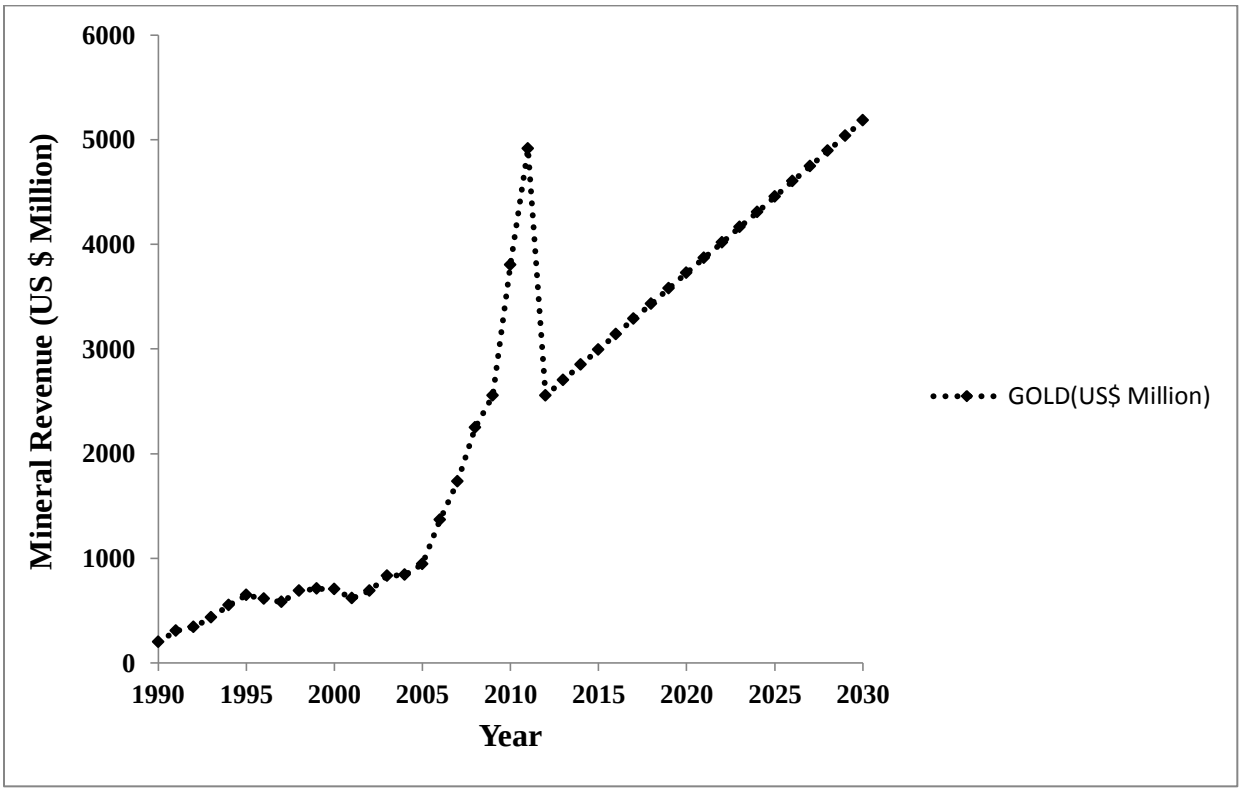

Fig.2 Relationship between mineral revenue and year in relation to gold income and projections between 2012 to 2030.

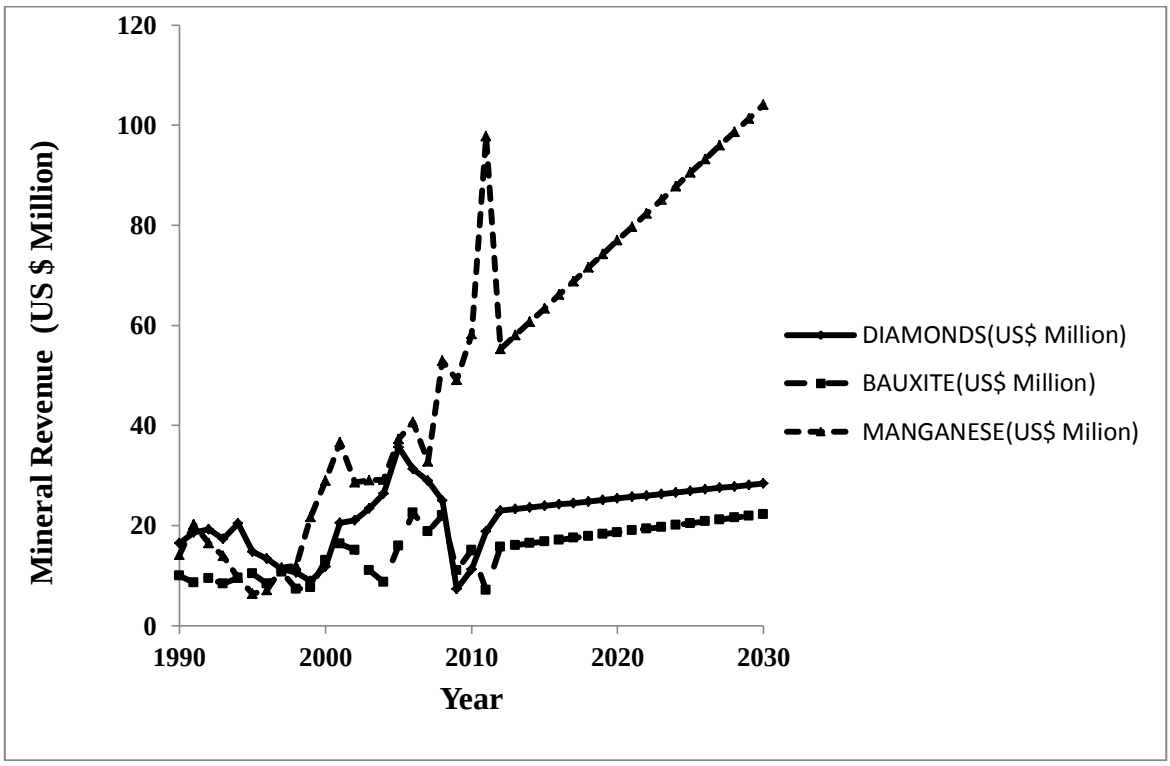

Fig 3. Relationship between minerals revenue and year in relation to income and projection between 2012 to 2030.

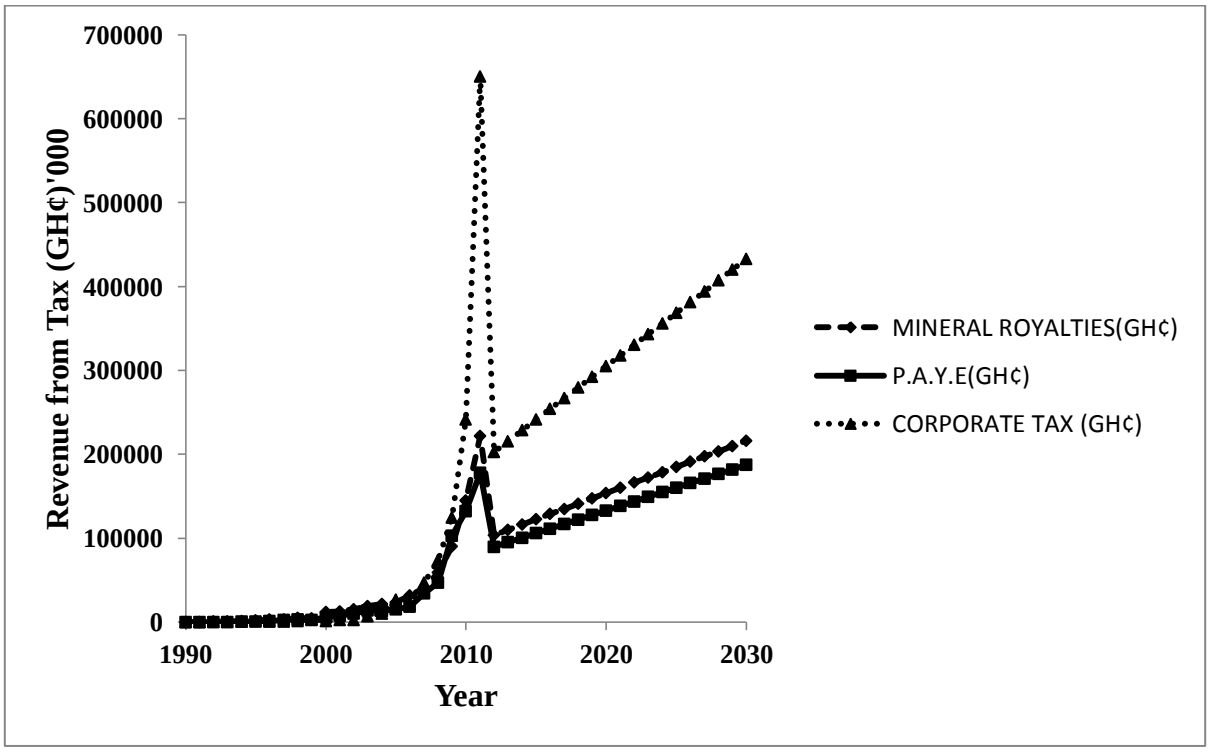

Fig.4 Relationship between contributions to government revenue and year in relation to taxes and projection between 2012 to 2030, GH¢1=US$0.5122
