UNIVERSITY OF AGDER

Illegal Chinese Gold Mining in Amansie West, Ghana – An Assessment of its Impact and Implications

By

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This master's thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

University of Agder, 2014
Faculty of Economics and Social Sciences
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Abstract

The thesis' objective is to assess the impact of Chinese illegal miners in the Amansie West District in Ghana. The illegal mining sector is seen as having several negative effects, environmentally as well as socially and economically. The influx of some 20-50 000 Chinese miners into Ghana is found to increase these impacts.

The Chinese illegal miners operate largely on farmland, which is bought from locals for the sum equivalent of approximately 6.5 years of farming income. This leads to a loss of long-term income for the farmer as well as the degradation of large land areas, which in the case of Amansie West is here estimated to cost between GHS 64 and 108 million to restore.

Social effects indicated to originate from the Chinese miners are increased prevalence of HIV and malaria as well as symptoms associated with mercury pollution and decline in school attendance. It is thus argued that their presence contributes to a decrease in human capital and farmland, in addition to various positive and negative economic effects including a rise in food prices.

Further, the study argues that the government's limited capacity, and a long-lasting trend of bad implementation of the country's small-scale mining policies, is a contributor to the situation's magnitude. In relation to this it is also found that Ghana's policy framework for the small-scale mining sector can be described as insufficient in both mitigating the impacts and solving the situation. This entails a low level of participation between the government and the grass-root, as well as the former's lack of provision of community needs like infrastructure and fertilizers. The latter is argued to increase local's susceptibility to welcome the Chinese miners as they contribute to increased income for local miners and as well as the provision of infrastructure and public needs through something reminiscent of CSR initiatives.

Acknowledgements

First of all I'd like to thank my family for their support throughout my whole education, where special thanks goes to my sister Stine for having been a great daily encouragement throughout the writing of the thesis.

The guidance of my supervisor Stein Sundstøl Eriksen is also much appreciated. Further, the project could not have been completed without the help and assistance of my hosts in Ghana. Thanks a lot to Sherry Adomah Bempah, and her husband Solomon for their help, guidance and hospitality. Solomon and Michael Adubofuor as well as Cheslyn Nutsugha, receive my greatest gratitude for being exemplary assistants and interpreters. Additional thanks goes to The Nordic African Institute for funding of the fieldwork. Lastly, my gratitude goes to all the inspiring lecturers in the master's program of Development Management.

Special thanks go to my dear Renate, for always supporting me in whatever I do, being an invaluable encouragement, girlfriend and friend.

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Abbreviations and acronyms

ASGM	Artisanal Small-scale Gold Mining
CEPS	Custom Excise and Preventive Services
CSR	Corporate Social Responsibility
DCE	District Chief Executive
DRC	Democratic Republic of Congo
EMM	Economy wide, multi market model
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EPA	Environmental Protection Agency
EPRCRG	Embassy of the People's Republic of China in the Republic of Ghana
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GHS	Ghana Cedi
GNI	Gross National Income
HDI	Human Development Index
MFA	Ministry of Foreign Affairs
NSCLNR	National Security Committee on Lands and Natural Resources
NYEP	National Youth Empowerment Programme
ODA	Official Development Assistance
PMMC	Precious Minerals Marketing Company
PPP	Purchase Power Parity
SM	Small-scale Mining
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
U.S	United States
USD	United States Dollars
WACAM	Wassa Association of Communities Affected by Mining
WHO	World Health Organization
WOA	Whole Ore Amalagamation

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Chapter 1: Introduction

1.1 Introduction

Throughout the past decades, China has to an increasing extent increased their cooperation with African countries, both through aid, but more so through the establishment of Chinese companies and foreign direct investments (FDI) (defined by OECD as cross-border investment by a company with the objective of obtaining a lasting interest in an enterprise in another economy) (2013). Some view the Chinese economic influx as highly potent in generating economic growth and development, as a sound alternative to the west's aid (Brautigham, 2011). In many cases, the increasing Sino-African cooperation has in fact led to increased growth for many, mostly through the building of necessary infrastructure in exchange of natural resources (Negi, 2008, p.42). This Chinese engagement is liberated from the moral-teaching and paternalistic role the West have played in Africa when tying their aid to various political conditions such as economic reforms and increased democratization (Moyo, 2012). Some of these have arguably set back the African economies rather than boost them; the structural adjustments, or Washington Consensus, perhaps being the most used example (Alnæs, 2003). China on the other hand, builds what many African countries need; infrastructure, hospitals, schools and railways to mention some. The country does this remarkably effective, and in return receives the much-needed resources required by its huge manufacture industry and its soon 1.5 billion population where still almost 1 billion lives on less than USD$ 5 a day (Moyo, 2012, p.166; The World Bank, 2014a).

However, many also argue that the African welcoming of the Chinese is fading, and that the social and grass-root economic impacts could be of negative character. These reactions is said to be triggered by poorly done construction work, bad working conditions, very tough business challenge, cultural differences as well as a rising feeling among many Africans that the Chinese are taking their resources with little in return (The Economist, 2011, 20.04; Negi 2008). Already, in Botswana, Namibia and Zambia among other countries in Africa, increasing anti-Chinese sentiments it are seen, which in many cases is also becoming more visible in the public space (Park, 2009; Brooks, 2010; Sautman and Hairong, 2009). With raised Chinese activity on the continent, such sentiments are potentially increasing in many countries, where illegal Chinese mining in Ghana can serve as one example. The understanding of the effects of China's significant presence is beginning to be academically

saturated, but increasing it further, is central in order to fully grasp how China's expansion and "going global" policy are to affect Africa and possibly large parts of the world.

With this as a background, the thesis will look at environmental, socio-economic and social impacts of illegal small-scale mining (SM) in Ghana, and to what extent the situation is getting worse with the influx of Chinese miners. In general, small-scale mining for gold is done in the form of artisanal mining, which entails the use of mercury; potentially highly poisonous to the workers and easily spreading in rivers and more widely into the ecosystem. The environmental long-term effects and eventual impact on local's livelihoods are thus very negative, and might surpass the activity's immediate socio-economic advantages. An increasing amount of young workers can be seen entering illegal artisanal mining, apparently with limited knowledge about its effects for them and the environment, which serves to reproduce the tendency (Hilson, 2008). These negative consequences are potentially further fuelled by the influx of Chinese illegal miners without giving Ghana the economic gains it gets from legal mining through its tax regime.

1.2 Main Objective

The study looks at the effects of the illegal small-scale mining (*galamsey*) sector in the Amansie West District in Ghana, and to what extent the Chinese small-scale mining activity alters the environment, socio-economic situation and social dynamics of the communities. Information is sought regarding aspects of how the Chinese operate, to what extent it benefits the local population and how the effects alters the district's potential for sustainable development. Lastly, investigation of policies regarding mining and their implementation will be researched in relation to how the situation of the Chinese *galamsey* has been treated by the government.

1.3 Rationale

The rationale for choosing this topic is the fact that small-scale gold mining practices are still a central source of income for millions in the developing world and as much as 13 million in Sub-Saharan Africa alone. However, the backside of such a significant amount of people being involved in small-scale gold mining is its major environmental damage and health effects, which contribute to what is allegedly called a poverty trap (Hilson & Pardie, 2006). The problems related to such extraction, both large-scale and small-scale, is now increasing

due to population growth in the developing world as well as increased demand for precious metals, and potentially also by the vast influx of Chinese into the African continent trying to secure natural resources. Thus, the researcher finds the topic very interesting, as it can contribute to increased understanding of China's wider presence in Africa, and more specifically the effects Chinese *galamsey* has on local communities in Ghana, and why the government struggles with finding sustainable solutions to the issue.

1.4 Research Questions

The aim of the research project is to discuss the effects of illegal mining done by Chinese in the Amansie West District, and its impact on the development's sustainability. It is also assessed to what extent the government has been able to deal with the issue, and potential challenges present in relation to this.

R1: In what ways have Chinese small-scale miners contributed to environmental, social and socio-economic impacts on the local community?

- How have local miner's income changed?
- What economic impact does the Chinese influx have on the community members?
- How does it affect local's agricultural practices?
- Have *galamsey*-related health issues increased?

R2: Why are public authorities not successful in dealing with the problem?

- Policies of regulation, to what extent are they adequate?
- Issues regarding implementation of policies.
- What forms of accountability and participation is/has been present?

1.5 Study Area

This section will present some basic facts and history about Ghana, Kumasi and Amansie West's geography, climate as well as a section dealing with political and economic aspects.

1.5.1 Geography & Demography

The whole country in total covers an area of 238 533 square km, of which around 21.1% is arable, and are divided in to 10 regions and 206 districts (World Bank, 2013b; Ghana Web,

2014; Ghana Districts, 2014). Ghana is surrounded by Burkina Faso, Togo and Côte d'Ivore, and has a rather long coastline serving as an important attraction for tourists, as well as providing the country with important access to global trade (Coullier, 2008, p.54-63). Ghana's export mainly consists of its wide array of natural resources such as gold, diamonds, manganese, bauxite and cocoa beans. Ghana is also endowed with large amounts of forests and fertile soil, which however, is seen as rapidly decreasing (UNEP, n.d).

Ghana has a population of around 25.5 million people, with an average life expectancy of 64.6 years (UNDP, 2013). The official language is English, but as much as 25 ethnic languages are still widely used (Ghana Web, 2013), contributing to a rich and varied culture. Most people prefer to speak their local language, or the most common language Twi. Thus in cases where education is limited, English proficiency might not be very good, as it is mostly practiced in official settings.

Figure 1: Map of Ghana

(Google Maps, 2013b)

1.5.2 Politics and Economy

In 1957, Ghana became the first Sub-Saharan country to achieve independence. However, after Kwame Nkrumah was elected president in 1960, the country experienced a rough

postcolonial period. It was first characterized by significant improvements in regard to roads, health, and schools as well as for the import-substituting industries. However, in spite of this, Ghana now experienced rising inflation and a massive debt (Federal Research Division, 1994, p.xxxii). After the overthrowing of Nkrumah in 1966, the country was led by military regimes, failing to deal with the country's economic problems. In the 70s, the country's economy stagnated, causing the International Monetary Fund (IMF) and the World Bank to implement their somewhat infamous structural policies in the 80s, which required the country to liberalise its economy and trade. With the implementation of the structural adjustment polices, some claim that the downward spiral was broken, and cocoa, mined resources, as well as the timber industry increased exports (Federal Research Division, 1994). However, the more holistic view is that the income of a majority of these exports primarily gained corporations based in Canada, Australia and the U.S, which acquired mining licenses in the country as a result of the policies, and rather generated high unemployment for Ghanaians. Thus, the policies and the now eightfold increase in gold production it contributed to, did only benefit Ghana to a rather limited extent if compared to what foreign companies gained (Hilson, 2003; Banchirigah, 2008, p.30).

After the approval of the constitution of 1992, which called for an elected parliament and a chief executive, Ghana is today one of the better operating democracies of the continent with its two party system, stable economic growth as well as an independent media (Government of Ghana, 2013c). In a recent study, Ghana progressed from 41st to 30th on the world ranking of press freedom, making it the third best African country on that matter (World Bank, 2013a). The current president is John Dramani Mahama, who in 2012 took over for John Atta Mills after his death. Ghana is also often termed the "peaceful island", in a rather chaotic West Africa, and has contributed with peace-making activities in neighbouring countries (Ghana Web, 2013).

The relatively good political situation have partly contributed to a declining poverty rate in recent years, which is now combined with an economic growth rate of 7.9%, and status as a lower middle-income country (World Bank, 2013b). Ghana's main contributors to its USD$ 40.17 billion GDP, are agricultural crops, mining and construction, as well as a large service sector (World Bank, 2013b; Ghana Statistical Service, 2012, p.5), all together providing a mean GNI per capita at USD$ 1684, where still 28,5% are below the poverty line (UNDP, 2013; World Bank, 2013a). In 2007, the country also discovered oil in the Gulf of Guinea,

and has thus, since 2010, been an oil exporter. Extraction has been done by the following U.S companies; Tullow, Kosmos, Andarko, Sabre Oil & Gas, as well as Ghana National Petroleum Corporation (Williams, 2012). The oil can be said to have contributed significantly to the country's growth in the recent years, where it is estimated that it accounted for 6.2% of the 13.7% growth rate of 2011 (African Development Bank Group, 2012, p.2). However, it can be argued that the U.S companies still ends up with an excessive share of the revenues (Boynton, 2013).

Excluding the minerals sector, the farming sector in Ghana account for the largest export share, where cocoa is the main contributor. In 2011 its exports amounted to USD$ 1.9 billion, or 7% of the GDP, employing around 720 000 people. The whole agricultural sector employs as many as 50.6%, and constitutes 25.3% of Ghana's GDP in 2011 (African Development Bank Group, 2012, p.8; Ghana Statistical Service, 2012, p.5).

The minerals sector of Ghana contributes to around 37% of the country's exports, and accounted for around 8.4% of the country's GDP in 2011, up 6.1% from the previous year, much due to the oil discovery (Ghana Statistical Service, 2012, p.5; African Development Bank Group, 2012, p.9). For gold exclusively, the output in 2011 was valued at USD$ 4.59 billion (World Gold Council, 2013). However, in spite of its significant contribution to GDP, it is central to note that it only employs 0.69% of the labour force (excluding *galamsey)* (African Development Bank Group, 2012, p.9; Bloch & Owusu, 2012, p.434).

Despite its general improvement with regards to economic growth, highly dependent on increased gold extraction and the discovery of oil, the economy can still be characterized as fairly aid dependent. In-fact, in 2011, Ghana still received USD$ 72.5 per capita in official development assistance (ODA), which is 35% more than the Sub-Saharan average at USD$ 53.2 (World Bank, 2014b).

An overview of key indicators of Ghana is shown in table 1. It can be seen that it's ranked rather low, at 135th place, with regards to human development, which includes factors like life expectancy, education and income.

Table 1: Key indicators of Ghana

Index	Value
Human Development Index *Ranking*	**135**
Health *Life expectancy at birth (years)*	**64,6**
Education *Mean years of schooling (of adults)*	**7**
Income *GNI per capita*	**USD 1,684$**
Poverty MPI *Multidimensional poverty index*	**0,144**
Gender *GII: Gender Inequality Index*	**0,565**
Demography *Population, total both sexes (thousands)*	**25 545,9**
Composite Indices *Non-income HDI value*	**0,646**
Innovation and tech. *Fixed and mobile phone subscribers per 100 people*	**72,6**
Trade, economy and income *index*	**0,417**
Inequality *Inequality-adjusted HDI value*	**0,379**

(UNDP, 2013)

1.5.3 Ashanti and the Amansie West District

The Ashanti region is divided into 27 districts where most of its population is highly centralized with around half of its population being located in just four of the districts (Government of Ghana, 2013b). Kumasi, the regional capital, serves as one of the main domestic gold markets with its 1.625 million inhabitants (Kumasi Metropolitan Assembly, 2006). Ashanti occupies 24 389 square kilometres, with a population density of 148.1 persons per square kilometre (Ghana Districts, 2013). Below is a map of the Ashanti region, where the specific area of study is marked.

Figure 2: Map of the Ashanti region and area of study

(Google Maps, 2013a)

The area of study, Amansie West District, is located west in the Ashanti region, and covers an area of approximately 1364 square kilometres, which makes it one of the region's largest districts. The district capital, Manso Nkwanta, is located 65 kilometres from Kumasi and is one of the five urban communities in the district. The remaining estimated three hundred villages are more remote, and difficult to access. The total population of the district is estimated to be 144,104, where around 3.8% are urban and 96.2% rural, and has an increasing annual population growth rate (that in 2010 was 2.9%). Administratively, Amansie West is divided into 4 zones which is further sub-divided into 25 operational areas each consisting of 4-6 communities (Ministry of Food and Agriculture, 2013). The district's household characteristics can usually take seven different forms, where the male-headed monogamous form is the most widespread. Further distributions of household types can be seen below:

Table 2: Household characteristics

Household Type	Percentage of Total
Male headed- single wife	70.3
Male headed- polygamous	5.5
Female headed widowed- single	9.1
Female headed widowed-polygamous	1.2
Female headed husband away	3.4
Male headed- divorced or single, widower	5.6
Female headed- divorced or single	4.9

(Ministry of Food and Agriculture, 2013)

The district's climate can be characterized as wet semi-equatorial, having a double rain season, with March to July being the main one, and the second between September and November being more moderate. Average monthly temperature is usually around 27 degrees Celsius. These traits, in combination with a surrounding rain forest type vegetation, makes the district very fertile and suitable for a range of crops of which some are cassava, cocoa, maize, palm oil, citrus and others (Ministry of Food and Agriculture, 2013). However, the increasingly dry period between November and February/March have led to an increase in bush fires, which combined with human activity, have led to a significant loss of forest-cover, transformed to savannah (Ghana Districts, 2013).

Although, in spite of being rich in natural resources, the economic situation cannot be termed prosperous, and the average yearly income is around 230$ USD per capita, approximately seven times lower than the national average. Additionally, inequality is very high, and as much as three quarters of the population only makes USD$ 0.7 a day ($255.5 a year), and the upper quarter as much as USD$ 4.35 a day ($1587.75 a year). The district's population work in sectors such as agriculture (70%), the service sector (8%) and the manufacturing/mining sector (22%). It is further plausible to state that most of the upper income recipients work in the latter sector as it usually brings in a higher income. This is rooted in the fact that the agricultural sector is mainly made up of inefficient small-scale farming with average farm sizes at 12.8 acres which has a limited income generating potential (Ministry of Food and Agriculture, 2013). Due to the low income level, the district has been termed the home of illegal mining, and has long been a widespread activity, now increasing in intensity (Tawiah, 2014).

Chapter 2: Literature review

2.1 Chinese Activity in Africa

The Chinese presence in African countries has been put at an increasingly central place in international media in recent years. However, its social and economic impacts are still not clearly understood (McNamee, 2012, p.9). Some often mentioned characteristics are bad working conditions, low salary and very tough competition for small-scale businesses (McNamee, 2012, p.9; Michel & Beuret, 2009, p.82). Statistics provided by The Brenthurst Foundation's study of Chinese traders in African countries, serves as a useful background for the project. Among other findings, they have found that as much as 88% of Chinese traders have come to Africa with a notion of it being easier to make money there compared to China (McNamee, 2012, p.14). Additionally, they have found that Chinese traders perceive themselves as their biggest business competitors, where the locals are only mentioned by 2% of the interviewees to be a business competitor (McNamee, 2012, p.28). This underlines an important issue; the fact that Africans are not taking sufficiently part in the growing business activity that can be seen on the continent. In-fact, it is postulated that in Nigeria as much as 350 000 local jobs has been lost to Chinese competition (Bond, 2006, p.60). This in turn might further contribute to the mentioned Sino-African social tension already seen many places. Situations where illegal Chinese workers enter various sectors disturbing the basis for income for many locals further worsen this. Further, there are many cases where Chinese companies, hiring both locals and Chinese, tend to pay the latter between four to six times higher salary plus exclusive benefits, for the exact same job, leaving locals not able to provide for their families in spite of working 7 days a week. Naturally, this is no sustainable way of operating, and could generate social tension (Cardenal & Araújo, 2013, p.166-167; Ayisi, 2013).

In a wider picture, what China is doing on the African continent today, is to ensure its own future growth and urbanization's huge demand for resources (Moyo, 2012). In the coming years we are most likely to see an increase in the world population, from around 7 billion to around 10 billion, where most of the increase will occur in developing countries (GRID Arendal, 2012). When this growth combines with the prospected increase in income and living standards for the developing world, it is bound to have a huge draw on already scarce resources, and potentially fuel a global political resource conflict. In addition, when this combines with climate change, which in many countries is manifested through drought as

well as extreme weather events, the situation will be further complicated, and the challenges ahead seem even bigger (IPCC, 2007).

The presence of Chinese miners in the Ashanti region in Ghana can in many ways be seen as one aspect of what the future "fight" for resources could entail, when prices will soar due to decreased supply and increased demand (Moyo, 2012). China's official way of coping with these challenges is to offer deals to countries in Africa (but also other regions like Latin America) which they cannot afford to reject. The deals comprise large loans or the building of infrastructure, such as roads, in the recipient country for a guarantee of repayment in resources within a given time (Cardenal & Araújo, 2013). In addition to this, there are often conditions linked to the deal, which include the requirement of using around 50% of the amount on Chinese goods or services. These deals are in many ways alternatives to the West's aid, without carrying conditions regarding increased democracy and reduced corruption, which naturally many African countries finds tempting (Condon, 2012; Moyo, 2010). It is claimed that although the relationship is often portrayed as being a win-win situation; the reality is sometimes that China gains much more than the counterpart. An example of this can be drawn from the DRC, where repayments are made with copper and cobalt, a major export commodity in the country. Since China owns the majority of the operating company Sicomines, they are also in a position to fix the prices as low as possible, and thus receiving more minerals in return than they would otherwise (Cardenal & Araújo, 2013). In the long run, this can leave nations scarce on resources they need when taking the step into being a processor of minerals and resources (which is much more valuable), not simply exporter of raw materials. This potential step however, does also require the west to remove its trade barriers currently into play that hinders many developing countries from being a manufacturer in the global market (Pegg, 2006, p.382). Additional to these aspects, China is also building several large-scale dams on the African continent (as known from within their own borders), which leaves major impacts on thousands of people, and in many cases armed groups. Thus, in a wider African scope, some postulates that China's activities on the continent are highly susceptible to cause regional violent conflicts (Bosshard, 2013).

On the other hand, many positive aspects can be found, as claimed for instance by Brautigham. Much needed capital is provided at a significant speed. Infrastructure, hospitals and schools are built equally fast, and are already generating growth. In many places, jobs are created, both in the sector of resource extraction, but also in the service sector as Chinese

middle class enters the continent establishing shops, cafés and other types of businesses. In spite of reports of bad working conditions and discrimination of locals, positive cooperation and co-work is widely present (Brautigham, 2011). Additionally, the Chinese presence can be seen as a new alternative to the West's aid, which in many ways has failed. Now at least, increasing economic activity is seen. Although it do not contribute to decreased corruption and democratization, it is generating growth and improvements of people's lives (Brautigham, 2011; Moyo, 2010, p.103-113). However, having this in mind, there are several examples where this Chinese-generated growth has not yet lead to any poverty reduction or increased equality (Condon, 2012). Thus, the situation's character is an on-going discussion, which by no means is clear-cut.

2.1.1 China in Ghana

China and West Africa's has a rather long history. Having started building bonds in the 1950s for reasons such as helping the Third World to work against the Soviet Union, as well as for other ideological reasons (Shoujun, 2013), China's relations to Ghana started in the 1960s, when diplomatic relations was established (EPRCRG, n.d). In the course of these years, China has contributed with several investments in the country, such as the Kumasi Youth Centre, the National Theatre, a hospital, and a stretch of the road between Kumasi and Accra (EPRCRG, n.d). Perhaps the most significant project China contributed with is the Bui hydroelectric dam, costing as much as USD $622 million and contributing with 400 MW to the energy grid (Mohan, 2010, p.4). These investments in combination with enforced diplomatic and political relations, has contributed to making China the country's biggest trading partner with a total trade of €4583 million, where import amounts to €4127 million (more than from EU in total and almost 4 times its U.S imports) and exports account for €456 million of the total trade (DG Trade, 2013). These numbers show that China's investments into Ghana is highly valuable for them, perhaps much more so than for Ghana itself. By Amanor, it is further argued that as the import/export imbalance shows, the huge amount of cheap Chinese products reaching the Ghanaian market undermines the country's chances of becoming a greater manufacturer. In-fact, as much as 25 000 jobs are estimated to have been cut as a result of the influx of these types of goods (Amanor, 2013). In addition to this, after the discovery of oil in the Gulf of Guinea, China has shown increasing interest for taking part in its extraction. This contributed to China offering, without luck, to buy the U.S Company Kosmos, which found the reserves, for USD$3 billion (Mohan, 2010, p.5).

As in many other African countries, and even more so, within China, bad working conditions and lack of respect for human rights has been a tendency among Chinese businesses. Furthermore, political motives as well as the perception that only poor quality Chinese products ends up in Ghana, have contributed to reports of China having a major image problem (Shoujun, 2013). This adds to the illegal activities done by Chinese, as in this case; the mining, which is hypothesized to further damage the Chinese's image and the potential for peaceful coexistence.

2.2 Illegal Small-Scale Mining in Ghana and its Impacts

This section will deal discuss literature regarding illegal small-scale gold mining in Ghana, as well as giving a brief introduction to the Chinese way of mining in the country.

2.2.1 Small-Scale Mining in Ghana

Artisanal small-scale gold mining have been practiced in Ghana since around the 4th century (Donkor et al., 2006). In the beginning it was done in very primitive ways which can be divided into three categories: shallow pit, deep shaft and alluvial. The latter was the most extensively used, and is a process which entails retrieving sediments from rivers containing gold particles, which was then washed multiple times before using mercury to creating an amalgam consisting of mercury and gold, which is then burned in order to leave pure gold behind (Botchway, 1995). Today, the so called *galamsey*[1] is conducted in very similar manners, both because it does not require much equipment but also due to the activity being closely connected to the land and the people's ancestors. However, in addition to working in rivers, it is now also normal to use the same method on land, in so-called surface mining operations (Hilson, 2002, p.16).

Even though it used to be rather difficult to get hold of, mercury has been used by many *galamsey* since the advent of Ghanaian gold mining. In 1932 the colonial rule made the use of mercury illegal, as its widespread use made Ghanaians prefer working in their own mines rather than for the Europeans (Armah et al., 2013). Thus, practically the whole small-scale mining sector was made illicit. It was not until the implementation of the mercury act of 1989,

[1] Means "gather and sell" in Twi, and is used for describing an illegal small-scale miner or the activity of mining illegally

that the buying and usage of mercury for mining was legalized, thus formalizing the sector causing a new gold rush (Donkor et al., 2006, p.501). Around ten years ago, the small-scale mining sector accounted for around 20% of Ghana's total gold output (Hilson, 2003). Currently, Ghana, as well as many other Sub-Saharan countries has liberalized their mining investment codes to attract more capital (Campbell, 2003; Pegg, 2006). This in turn has had devastating implications for rural communities. Examples of such are displacement (often implying loss of farmland), leading to increased unemployment, which again leads many into being *galamsey* miners (Banchirigah, 2008, p.30, 31). Today, a large part of those working in the small-scale mining sector operate illegally. By Hilson it is estimated to be around 30 000 legal small-scale miners, and as much as 170 000, or more, illegal (2001, p.8, 21). By a more recent source, it is estimated that around 265 000, or 85% of small-scale miners were unlicensed (Carson et al., 2006). Another source stated that as much as 1 million operate illegally (Banchirigah, 2008, p.29). Thus, the number can be seen to rapidly increase. In Ghana, the mining policy processes themselves are characterized as having a very low degree of public participation, as well as parliamentarians lacking resources and skills to understand the complex issues regarding mining. This further combines with a situation where politicians very seldom are replaced when responding inadequately to the needs of the country's development, making improvements in governance difficult (Ayee et al., 2011, p.19, 20).

2.2.2 Marginalization of *Galamsey*

The discourse of illegal small-scale miners in Ghana can be portrayed as generally highly negative, focusing on the *galamseys'* role as irresponsibly using mercury in their extraction of gold with no concern for the communities' health and environment. This is paired with a situation where many officials tend to view small-scale miners, and particularly *galamsey,* as an obstacle to development. The sentiments are often that the small-scale miners spoil the investment potential the country can realise from the large-scale mining companies. In 1989, when small-scale mining was formalized, those practicing traditional small-scale mining without a licence, as had been done in several centuries, suddenly turned into illegal workers. With few alternative sources of income, low ability to register due to bureaucratic delays, and no access to education regarding how to mine more efficiently and environmentally sound; these miners are now characterized as a highly marginalized group. Another main source of inability to register is that most land set off for mining is already assigned to large-scale mining companies, forcing locals to pursue illegal mining. By making miners' operations illicit, it also undermines awareness rising of mining's environmental- and health effects.

Thus, it is argued that criminalizing miners in this way, without offering proper alternatives is not a viable solution to the issue (Tschkert & Singha, 2007).

The general illegal mining operations, can be said to have a bad influence on the investment environment for legal and bigger mining companies. To mitigate this, corporations have invested in organizations working to promote alternative activities to the mining. Examples of such are cassava harvesting, farming and poultry rearing, which have been done with limited success (Banchirigah, 2008, p.36).

Further, according to Hilson, most locals are reluctant to undergo training to become registered legal miners (2001, p.19). This is hypothesized as rooted in the fact that governmental policy processes have not been done with sufficient stakeholder participation. It is even reported that many managers and mine engineers state that efforts taken with regards to policymaking and implementation in the mining sector has been done very poorly (Hilson 2001, p.19). However, in the academic sphere one is starting to realize that what is needed to deal with the *galamsey* sector is *"an integrated approach (...) that provides space and support for active community participation"* (Tschakert & Singha, 2007, p.1310).

2.2.2 Chinese Illegal Small-Scale Mining

In the academic sphere, the presence of the Chinese *galamsey* in Ghana is so far not well covered, and most knowledge is only based on news reports, which naturally is the reason for writing this thesis. Thus, the information here presented concerning the Chinese miners, does largely not consist of any academic peer-reviewed sources.

In the more recent period of mining, illegal Chinese miners play a significant role, not only in quantity, but also potentially in level of environmental degradation they are causing. It is estimated that there are around 20 000 to 50 000 illegal Chinese miners in the country, most of which are from the "dried out" former gold-mining county Shanglin in the Guangxi province (Dong, 2013; Jiao, 2013). Furthermore, there are currently six legal major Chinese mining companies located in the country (Ayisi, 2013). The income from those operating illegally directly contributes to a situation where an increasing portion of the gold output disappears out of the country, without enabling Ghana to tax it. Currently the tax rate for mining companies stands at 25%, but is currently considered by the government to be

increased to 35% as well as introducing an extra 10% tax rate for all revenue (Booyenes, 2012).

Along with a significant amount of unregistered locals, as according to the law, all small-scale mining conducted by any foreigners in Ghana is characterized as illegal, but is yet not stopped by the government (Hilson, 2001).

In many cases, it is reported to be a cooperation between Chinese, who holds the funds, and Ghanaians who are legally able to obtain the necessary permissions. As part of this, there is brought in large machines and equipment to be used for the mining on land that the local community initially thought where to be used for farming, not destruction of farmland for mining (Bax, 2012). In order to get access to the land, the Chinese are reported to pay an entry fee of as much as GHS 20-30,000 to the landowner (Jiao, 2013). As mentioned, the Chinese are stated to have an image problem in Ghana, which according to news sources, has been manifested in conflict, and violent incidents (Huifeng, 2013b).

Due to the Chinese mechanized mining process, the impacts on environment are potentially heavily increased. When this, as well as pollution of locals' drinking water, combines with potential bad working conditions and general incidents of disrespect from the side of the Chinese, it can in many ways be characterized as negative for the communities (Bax, 2012).

Chapter 3: Theoretical Framework

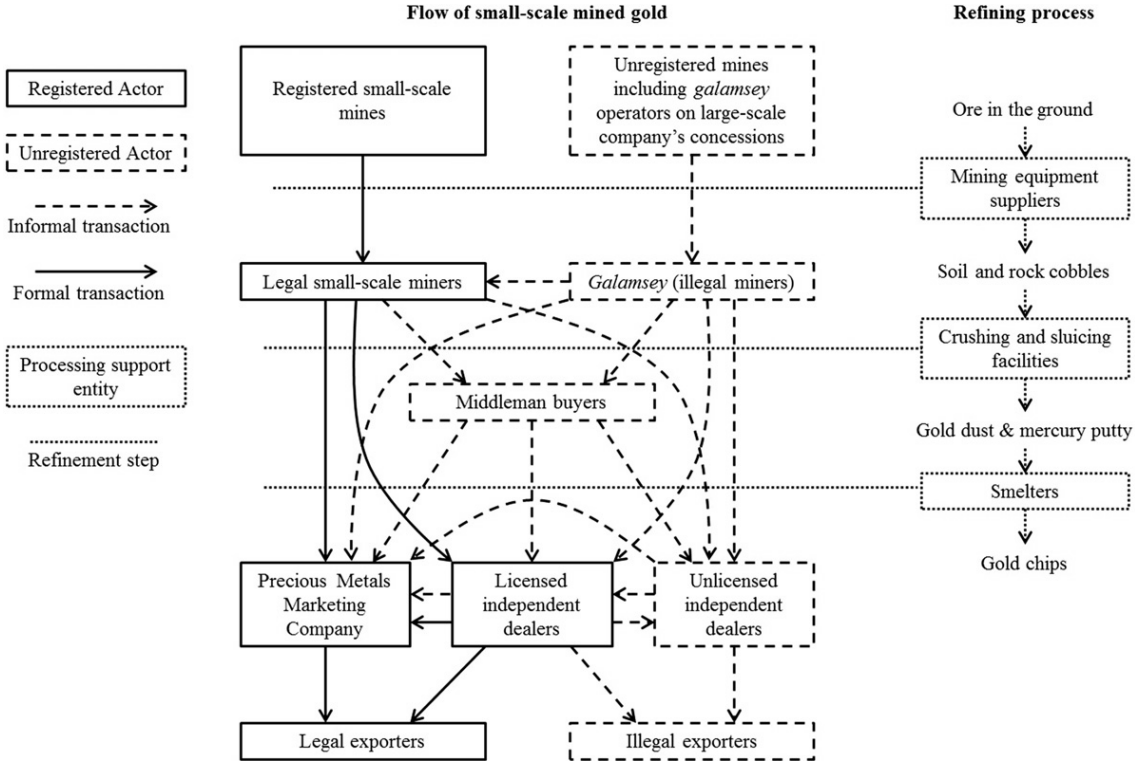
Presented here is the theoretical framework that is applied in the analysis of the findings

3.1 R1 – The Impacts of the Chinese G*alamsey*

In this section, the theory that is used in discussing the impacts of the presence of Chinese miners in Amansie West, is presented.

3.1.1 Links in the Small-scale Mining Sector

Figure 3: Flow of gold from small-scale mining



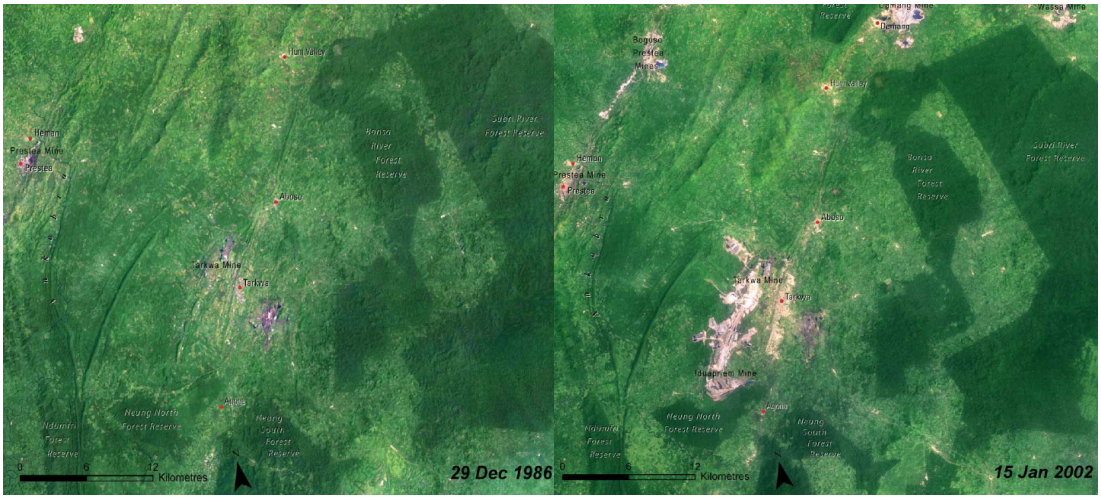
(Teschner, 2012, p.310)

The illustration above shows the organization of the formal and informal SM-sector in Ghana. As can be seen, the so-called middlemen are highly central in both sectors, as they serve to enable *galamsey* to indirectly sell their gold to the governmental organization PMMC (Precious Minerals Marketing Company). It also becomes clear that both sectors are very intertwined, and that the gold produced in both sectors ends up in the legal and illegal market, both domestically and internationally.

3.1.2 Environmental Impacts

Ghana is not only endowed with large reserves of minerals, but also vast amounts of forest and rainforest. In the last 50 years however, there has been a 90% decrease in forest-cover, with a current annual deforestation rate of 2% largely caused by heavy logging, overgrazing, and mining (UNEP, n.d). In 2006, around 12% of Ghana's total areal was under some sort of mining concession (Schueler et al. 2011, p.531). Together with bad policy implementation and a low degree of stakeholder participation, the country's corruption score of 46 (where zero is no corruption and hundred is full corruption) contributes to the difficulty of reducing the forest loss as well as illegal mining in particular (Transparency International 2013a; UNEP, n.d). Forest loss is a main contributor globally to the unbalanced CO_2 levels in the atmosphere causing climate change (Barker et al., 2007, p.67; IPCC, 2007), and is thus a problem that exceeds Ghana's own borders. In addition to this, forest loss cause landslides and degraded land. The significance of mining-related deforestation can be seen below in a comparison of a 1986 picture of the Tarkwa mine with a more recent 2002 photo

Figure 4: Degraded land from mining in Tarkwa



(UNEP, n.d)

As briefly mentioned, land degradation is often the result of severe deforestation. While deforestation only entails removing the trees from the earth, surface mining includes removing all vegetation and dig up to several metres in depth, which directly damages the topsoil cover. Thus, whether the original land consists of forest or farmland; surface mining always leads to degradation of the land unless right land reclamation is conducted. This

process can be said to directly affect the local ecosystem, as well as the general CO_2 levels, and thus the climate. In addition to the mere emissions from deforestation, the soil's potential for carbon sequestration is lost (World Meteorological Organization, 2006, p. 9, 10). Hence, deforestation from the mining does not only lead to increased emissions of CO_2, but the following land degradation can also contribute to the eco-system's reduced ability to capture and sequestrate carbon dioxide which ultimately means a net increase in CO_2 in the atmosphere, as well as reduced soil fertility.

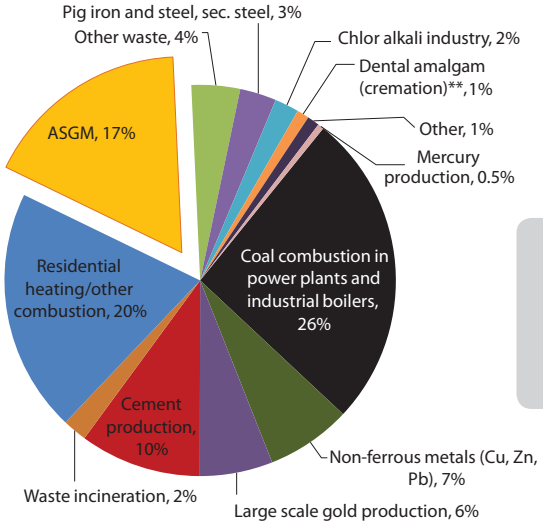
Asiedu's theory of land reclamation is used for shedding light on the severity of land degradation and what is needed for proper practice to be present. Land reclamation is defined as *"a process of making a piece of disturbed land fit for cultivation"* (Asiedu, 2013, p.31). There are generally two options when it comes to land reclamation: *natural recovery* and *assisted restoration*. Often these two methods are combined. Which method to use, depends on the desired outcome. The former is preferable if the land is intended to be used for forest-cover, while the latter is applied when the land is to be used for agriculture or mixed activities (Asiedu, 2013, p.32). The process of actively reclaiming the land through *assisted restoration* is a long and costly process, and requires between 5-10 years of active assistance in order to be effective. Thus total costs are estimated to be around 100 947 GHS for one hectare of land. The process is initiated by covering up the land without compacting the soil, but rather letting it settle in a period of around 3-6 months. Next is the process of importing topsoil to the area (alternatively composted organic material can be used), which is to be spread to a depth of around 150 mm. Two weeks following this process there should be planted a cover crop that has high nitrogen fixing ability. Three months later the entire field is cut, and the cover crop is worked into the topsoil, as well as applying a nitrogen based fertilizer. Three weeks after, one should plant native or exotic trees at a quantity of minimum 450 seeds per hectare (Asiedu, 2013). This theory will be applied in the analysis in order to have a guideline for what a good and holistic reclamation process entails and costs, which is a central aspect of dealing with the impact from Chinese *galamsey*.

In addition to the potential cost of reclaiming land, the alternative cost of lost farmland leads to decreased farming output, lower demand for farming equipment and so forth. Sarpong and Dao have constructed what they call the economy wide, multi market model (EMM) estimating the net cost of soil loss. Its impact on the total agricultural output in Ghana is a USD$ 860 million lower agricultural GDP in 2015 than it could have been without the soil

loss. The model further estimates that, just in the case of the Ashanti region, with the rate of soil loss being the same, the projected 2015 poverty rate will be 19.1% against an estimated 13.4 % without the soil loss (2007, p.17, 21). Even though the EMM model has its caveats, such as the fact that there is no clear cut relationship between erosion and productivity, it will be used in the analysis to stress the importance of limiting land degradation.

Another environmental impact that is caused directly by the mining activity is the emission of mercury into the eco-system, which is currently considered a priority environmental concern by the Ghanaian government (Hilson et al., 2006, p.276). Mercury is used in the small-scale mining extraction processes and can cause great harm to the environment: "*Once in the natural environment, mercury undergoes a change in speciation from an inorganic to a stable methylated state (MeHg) by non-ezymically and microbial action, and when ingested, eco-toxicological effects result*" (Hilson 2001, p.15). The substance is used in two different forms of small-scale mining; whole ore amalgamation (WOA) and concentrate amalgamation. The first method entails using mercury on the whole ore, thus making it the worst practice, where as much as 4-50 parts mercury is used per part gold, which still captures only 30% of the gold. The latter method is more efficient, as the gold is concentrated into a smaller mass by applying the gravitational method using a sluice box and carpets, before using mercury in the amalgamation process (UNEP, 2011, p. 12-16). Mercury is characterized as dispersing very quickly through the atmosphere, and can remain there for up to 2 years (Donkor et al., 2006, p.1). Thus, mercury pollution is not only a local problem, but also global, as it can spread great distances and between continents, reach organic and biological material there, and eventually entering the human body through food (Tschakert & Singha, 2007, p.1309). Additionally, this is said to be leading to some biological species' mass extinction (Donkor et al., 2006, p.2-6). By UNEP it has been estimated that 1400 ton of mercury were used just in the artisanal small-scale gold mining (ASGM) sector globally in 2011, making it the largest source of demand for the metal (2012). Thus, the sector's emissions to water and global atmosphere are also among the largest, as visualised in figure 5. If limited to air pollution, it is only second to coal combustion (UNEP, 2012).

Figure 5: Source of mercury emissions to water and air combined



(UNEP, 2012)

It is also seen that during periods of draughts, artisanal mining increases, as it is an activity that often compliments the agriculture production; the former ensures income in periods with low productivity in the latter (Donkor et al., 2007, p.501). In Ghana, the climate change is most likely leading to less rain, as is it already observed that rainfall in West Africa between 1968 to 1990, was 20-40% lower than between 1931 to 1960 (Boko et al., 2007, p. 436). Thus, this can serve to reduce agricultural yields and further increase the artisanal mining and mercury pollution as well as land degradation. This can further contribute to a downward spiral where less yielding farmland contributes to the alteration of more land for mining. These mentioned effects of climate change is already seen in the Ashanti region, and as seen in the table 3; 86,5%-96,8% have replied that they agree or strongly agree that the weather got hotter, more unpredictable and with less rain.

Table 3: Perceived change in climate

Table 10

The weather got hotter, rains became less and unexpected over the years. (%)							
		Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total
Region	Ashanti Region	28.3	58.2	8.2	5	0.4	502
	Brong Ahafo Region	29.5	63.8	3.7	2.6	0.4	271
	Central Region	35.9	54.1	4.8	4.3	1	209
	Eastern Region	23	57.1	5.7	13	1.1	261
	Northern Region	36.5	53.3	1.4	4.1	1.7	345
	Upper East Region	25.1	60.1	9.9	3.4	1.5	203
	Upper West Region	56.9	35.6	5.7	1.7	0	174
	Volta Region	45.5	48.4	2.6	1.3	2.2	312
	Western Region	30.7	49.1	8.2	9.2	2.7	293
Total		33.7	54.1	6	5	1.2	2570
Unanswered							53

Table 11

The weather becomes more unpredictable from year to year. (%)							
		Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total
Region	Ashanti Region	35.5	61.3	1.8	1	0.4	501
	Brong Ahafo Region	37.6	56.2	3.6	1.5	1.1	274
	Central Region	29.9	55.9	8.1	4.7	1.4	211
	Eastern Region	23.4	64	6.1	5	1.5	261
	Northern Region	41.1	56.6	1.1	0.6	0.6	348
	Upper East Region	24.9	71.2	3.4	0	0.5	205
	Upper West Region	60.9	39.1	0	0	0	174
	Volta Region	39.7	56.1	1.6	1.6	1	310
	Western Region	33	60.2	5.1	1	0.7	294
Total		35.9	58.5	3.2	1.6	0.8	2578
Unanswered							45

(Müller-Kuckelberg, 2012, p.17)

3.1.3 Social Impacts

In 1995 it was estimated that around 5 tons of mercury was dispersed into the eco-system in Ghana annually from small-scale mining (World Bank, 1995), which with the increased activity now seen by the Chinese influx, plausibly have increased.

The use of mercury for mining purposes can be said to have mild to severe effects on the people using it on a daily basis as well as the eco-system and eventually other non-miners. This aspect of the mining activity is thus central in the thesis, and as Lebel states; *"if people are not in good health, development cannot be sustainable"* (2003, p.4).

The already described process of doing ASGM releases mercury in two forms, both as metal and as mercury vapour. The former is released into the environment, which is then oxidized into inorganic Hg^{2+} that combines with various bacteria and takes on toxic organic forms such as methyl mercury which attacks the central and peripheral nervous system (WHO, 2007). The latter (vapour), however, is released in the process of burning the mercury to separate the gold. This is further ingested when breathing, and can cause various severe symptoms. These can range from insomnia, memory loss, headaches and cognitive motor dysfunction, as well

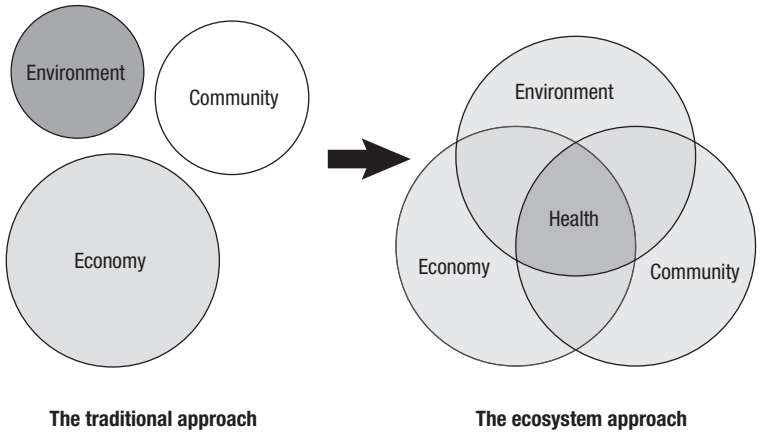
as other behavioural disorders. Symptoms are often a manifestation of effects like deficiencies in the digestive and immune system as well as kidneys and lungs, which might be fatal (WHO, 2007). In addition respiratory complications are seen as a major symptom to airborne mercury pollution (Lebel, 2003, p. 33; Veiga et al., 2006, p.445). These symptoms generally occur at various concentrations that are higher than the WHO's limit of 1000 nanogram/cubic meter (WHO, 2007, p.3). The general awareness among locals regarding these health effects is said to be rather limited, and is rooted in the absence of an effective channel of knowledge from health personnel to the grass-root (Veiga et al., 2006, p.445). A few programs have been arranged on mercury awareness; however, all women were excluded (Tschakert & Singha, 2007, p.1316). This is an obvious limitation as half of those employed in the ASGM-sector are women (Hilson & Potter, 2003).

Increased child pregnancy and increased prevalence of single mothers is a potential impact from the Chinese *galamsey*. The former is associated with numerous risk factors, some of them being lower birth weight, premature birth, negative long-term cognitive and educational development and performance. It can further be a cause of unmarried status and/or poverty (Gueorguieva et al., 2001). The latter, however, can naturally lead to a time constrain also serving as an economic limitation.

Other social impacts that are strongly associated with the *galamsey* communities are increased school dropout-rates, as well as significantly increased HIV- and malaria rates. The latter is seen as an effect of open water-filled mining pits serving as breeding ground for mosquitoes (Carson et al., 2005, p.44; Hilson 2002, p.65).

Data concerning the perceived and registered effects the mining has on people's health have been retrieved both from interviewing locals as well as using official data. In understanding the situation's various effects, and their relation, the so-called *ecosystem approach to human health* will be applied. The approach sees economy, environment and the community as equally important, instead of seeing them as separate entities. The theory also postulates that health is something which is defined in interaction between these spheres (Lebel, 2003). Further, as Dansereau describes the approach in the foreword; it sees health as "*(...) a harmonious participation in the resources of the environment, which allows individuals the full play of their functions and aptitudes."* rather than the absence of illness, as visualised in figure 6 (2003, p.ix).

Figure 6: Eco-system approach to human health



(Lebel, 2003, p.7)

In addition to impacts on the environment, health-effects are thus a central aspect of the analysis, and will be seen in conjunction with education, which combined constitute what is termed Human Capital. The term vas originally coined by Adam Smith in his work *Wealth of Nations* first published in 1776 (Smith, 1982). It was later spurred into widespread use by Theodore W. Schultz in the 60s as the accumulation of investments in education, health and other factors relevant for productivity (1961). The concept is here seen as central to both well-being and to living rewarding, satisfying lives, both directly and indirectly through generating higher income. Within this assumption it is also implied that education plays the central role in self-sustaining growth and development. The two aspects of human capital are further seen as highly connected, as education is not possible without adequate health (Todaro & Smith, 2011, p.359).

In relation to health effects from mining, the study done by Williams and McGrath will be used to discuss violence between the Chinese *galamsey* and Ghanaians. The study, done in USA, simply found that victims of crime are more likely to own a gun. They also found that those who express fear of neighbouring surroundings were more likely to be in possession of a firearm. Additional to this there was a positive relationship between proneness to violence and gun ownership (Williams & McGrath, 1976, p.25).

Theorists like Shuntian Yao states that Chinese corruption has reached endemic levels the last decades where this is heavily rooted in the economic reforms of the 1990s. Yao also mentions

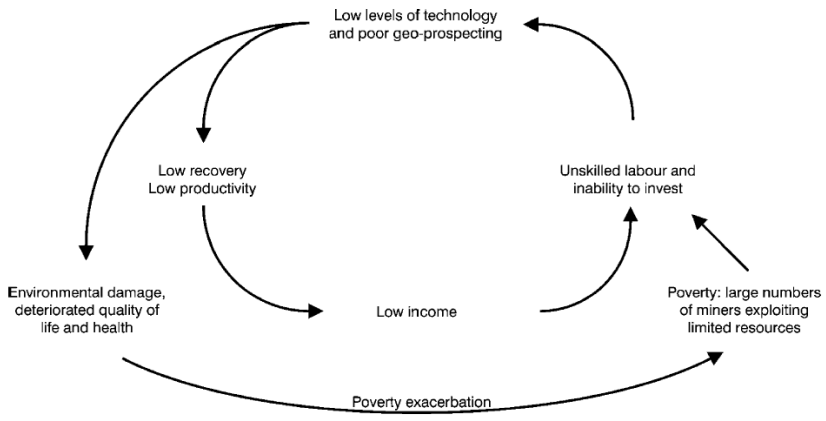
a widespread assumption that corruption in China is highly connected to the Chinese culture, mentioning a long tradition of holding personal connections higher than the law (2002). This theory will be applied in discussing whether the influx of Chinese *galamsey* can also contribute to increased corruption in Ghana.

Corporate social responsibility (CSR) as a concept is used to discuss part of the Chinese *galamsey's* contribution to the local community. According to Amponsha-Tawhia, the concepts entail *"the strategic decision of an organization to voluntary act upon the social factors that have the potential of militating against the fulfillment of corporate goals"* (n.d, p.108). The Chinese *galamsey* are here understood as an organization *per se.*

3.1.4 Socio-economic Impacts

Looking at these above-mentioned effects of illegal small-scale mining, it is by many postulated that the illegal small-scale mining sector in the developing world is driven by poverty (Tshackert & Singha, 2007; Noetstaller, 1996; Hilson & Pardie, 2006). Being poor give miners no ability to invest in better equipment, and thus force them to use mercury in very primitive extraction methods. This is fairly inefficient, and thus reproduces the low-income trend that is enforced by a very low level of skills. In a wider picture this leads to environmental damage and lowered quality of health that increases poverty even further, even for those not initially practicing mining. Thus, this can lead even more people to endeavour *galamsey* as a source of income, and further increases the pressure on scarce resources, reducing per capita return (Hilson & Pardie, 2006). These links are visualized below:

Figure 7: *Galamsey* as a poverty trap



(Hilson & Pardie, 2006, p.108)

The mercury used for extraction, which partly causes these environmental- and health threats, is portrayed as one main agent in the poverty trap. This is rooted not only in its effects on health and environment, but also due to the fact that mercury dealers are most often also the buyers of the gold that the miners extract. This creates a situation where the gold buyer has leverage that can be used to dramatically reduce the prices of the gold, and thus the income of the small-scale miners. The lack of know-how and simple equipment to recapture the mercury for reuse further increases the economic impact this power imbalance cause (Hilson & Pardie, 2006, p.109). Hilson & Pardie's theory will be used in relation to the findings, to determine the Chinese *galamsey's* place in, and effect on, the so-called poverty trap.

The basic economic theory of supply and demand by Alfred Marshall is applied in order to explain certain economic effects of the Chinese *galamsey* operations on the local community. The theory simply states that when demand for a commodity rises or the supply decreases, the price will also increase, and opposite if the demand declines or supply increases (Marshall, 1920).

3.2 R2 – Why the State Fails in Solving the Situation

In this section, theory applied in the analysis regarding the government's role in the situation and why they have not been able to solve it, is presented.

3.2.1 Resource Curse, Corruption and Conflict

Having a large amount of resources, and at the same time managing them in a sound way, can be difficult. With the lack of good governance, in combination with poverty, a sound resource management cannot be achieved, which often leads to what many call the resource curse (Ross, 2003). First of all, the resource curse can comprise a structural problem where leaders and politicians make it a habit not to invest in human capital, infrastructure and other aspects that are crucial for development to happen. The government have no incentive for getting tax income from a functioning society, and thus have no reason to invest in the necessities such as health, education, research and development, and so on (Ross, 2003, p.22). This situation creates a nation that is very dependent on its resource, often without benefiting the population much. Robust findings also show that the natural resources, in the case of developing countries, increases corruption (Busse & Göning, 2011). Further, if this situation proceeds and combines with bad policies and governance, a country can experience what is termed the

"Dutch Disease". As taken from the oil curse of Netherlands in the 1960s, this describes an economy where large wealth accrues from one resource (in their case, oil) and thus, according to macroeconomic principals, increases the value of the country's currency. This again, contributes to a situation where the country can lose its ability to compete on the world market and thus drastically reduces its exports, and in some cases causes it to deindustrialize. Hence, the dependence on oil gets even larger, and one gets a downward negative spiral (The Levin Institute, 2013).

In addition to this, the resource curse can also lead to conflict. Nigeria is regularly used as the prime example in this case, with several guerrilla groups having emerged, causing conflict as well as environmental harm through cutting oil pipelines for sabotage and theft (Watts, 2004). As Maathai mentions, such conflicts are even more likely to occur in cases where the given resource is getting scarce, which is something that can be seen on the whole continent (2009, p.249). The level of conflict is said to increase in occurrence the coming decades, due to both climate change (which will greatly reduce arable land, increase floods and draughts, and thus cause migration), but also due to increased demand for metals, food, and other resources important for feeding the potential growth of the third world (Maathai, 2009, p.249, 251).

3.2.2 Adequacy of Policies and Political Action

This and the following section are applied in the analysis to discuss research question two; whether Ghana has sufficient policies that would serve as a solution if properly implemented. If so, it will also be discussed, through the use of section 3.2.3, different explanations as to why they are not successfully implemented.

In 2006 the policy framework for Ghana's mining sector was revised in what was called the 2006 Minerals and Mining Act (Act 203), replacing the Mineral and Mining Law 1986, PNDCL.153. The new framework was divided into distinct sections, where one entailed large-scale mining, and the other, section 81-99 applies to small-scale mining (Mining Act, 2006). Key aspects of these policies will be analyzed with regards to their adequacy in relation to the current SM-sector, as well as being used to shed light upon data retrieved through field interviews.

Hilson & Potter describes a situation where the procedure for registering as a small-scale miner is very complicated and time consuming, riddled with bureaucracy. In the case of poor artisanal miners, with no alternative income, this is a central contributor to why there are so few registered miners (Hilson & Potter, 2003). Further, the seven district support centers set up, meant to provide educational and financial support to decentralized small-scale miners, are said to be significantly underfunded as well as short on knowledge and thus has a limited potential for practical guidance on the complicated policies and registration procedures (Hilson & Potter, 2005). This is further said to have contributed to a widespread rumor that one does not get good land as a registered miner (Carson et al., 2006). These two sets of theory will be used to shed light upon findings regarding the framework for registration, and discuss whether the policies are sufficient or simply poorly implemented.

The emissions of mercury may naturally increase when the ASGM activity increases, thus governmental policies and actions with regards to limiting mercury emissions from the sector is applied in the analysis. The global issue of mercury is defined as a serious environmental and health threat, and in 2013 the UNEP created The Minamata Convention on Mercury in order to globally tackle the issue. The convention obliges its signatories to realize, recognize and deal with the threat by reducing its own anthropogenic mercury emissions. More specifically, it states the following:

"Each Party that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing." (UNEP, 2013, p.7).

The convention will be applied in the analysis to discuss the adequacy of Ghana's actions towards mitigating mercury pollution from mining.

Teschner describes the current situation in Ghana, where the policies in place to regulate small-scale mining, are no longer covering the complex situation on the ground. Aspects such as the lack of enforcement of mining policies, with the ban of heavy machines for small-scale gold extraction being one example, have led to a situation where the efficiency and income of both registered and un-registered miners (*galamsey)*, are now so high, that implementing these laws might be highly difficult and unrealistic (Teschner, 2012). Thus, due to the laws

perhaps not being sufficient, there is now also an underlying paradox in the situation entailing the challenge of having to regulate an illegal activity. This theory is used to discuss the policies with regards to small-scale mining, and to what extent they are now sufficient.

A central issue in the mining sector is said to be the distribution of its contribution to the government's income. In 2007, only 10% of the income was distributed to Ghana's Minerals Development Fund. This fund is intended to compensate mining communities for the negative impacts they carry, through distributing the 10% cut to agencies responsible for mining policy implementation which is said to ideally act on expressed sentiments from the community. However, the spending of the 10% cut was not subject to any transparency, and thus failing to serve its purpose. Roe & Jonathan argues that the compliance to Extractive Industries Transparency Initiative (EITI) would improve the situation (Roe & Jonathan, 2007, p.76, 77). Findings retrieved through the analysis of the EITI report, will be used in relation to this theory, to determine the initiatives success with regards to this aspect (Ministry of Finance and Economic Planning, 2013).

3.2.3 The Challenges to Implementation

In order to make societies sustainable, environmentally, economically, and socially, having good policies is crucial. For these to have its intended effects however, the policy process itself needs to be conducted in a sound way. It is claimed that processes that are interactive and dynamic, seeing implementation and creation of the policy as the same process, will give best results (Sutton, 1999). This way of conducting public affairs, is often termed participatory governance, which seeks to include, not only organized but also non-organized, citizens in the process (Tadesse et al., 2008, p.9). Participation is here seen as a democratic right (Reed, 2008), and by including local interests into decision-making processes at an early stage; the likelihood that local needs and priorities are met will be greater (Dougill et al., 2006). Thus, the likelihood of successful implementation is also higher, and contrary, the lack of participation can undermine its successfulness. Aye et al.'s theory describes a low level of participation in mining policies in Ghana, which is worsened by the fact that a large portion of the MPs are in-fact also members of the mining companies' boards (Ayee et al., 2011, p.19, 20, 29). This theory is applied in the analysis to discuss the level of participation, and to what extent this could serve as an obstacle to the implementation of policies that could have improved the situation.

Further, according to Ayee et al., it seems the 2006 Minerals and Mining Act, has not been sufficiently implemented. As in most other sectors, after such an act has been approved, the norm is to also agree on a policy that is to guide the interpretation and execution of that law, but this has not yet been the case of the mining sector (Ayee et al., 2011, p.34).

Civil society's participation in governmental decisions is further closely connected to government accountability. In certain cases, the former can also serve to be a tool for reducing the latter, and thus decrease, rather than increase, the governance quality. This is argued by Kpessa to be rooted in the fact that a channel for participation can be used participation channels provide stakeholders with agency, thus reducing the government's accountability (Kpessa, 2011, p.37). Hence, findings with regards to grass-root participation that are present will be discussed against whether these channels really serve their purpose in benefitting the grass-root. In relation to this, the EITI that Ghana has joined is part of the discussion (EITI, 2014b).

As Kane describes, many Chinese miners are able to cross Ghana's borders on land (2013). Thus, an issue that becomes central in the analysis of the government's capacity to handle the situation is the state of its border control. Sosuh argues that Ghana's current border control is far from adequate, characterized by corruption, where the opposite is even seen as culturally unacceptable among the employees, making them more susceptible to lose their jobs than if they accept corruption. This is further said to pair with a significant lack of resource as well as a very low level of cooperation between the different agencies involved in border control (Sosuh, 2011). Thus Sosuh's theory is applied in relation to findings regarding border control and the Chinese's ability to re-enter after having been deported.

Compared to other Sub-Saharan countries, Ghana is ranked rather high when it comes to its government capacity. In spite of this, the government is said to have major challenges with regards to its capacity in relation to the small-scale mining sector. Some key issues are few qualified staff with a high turnover, lack of funding for performing monitoring, as well as a poorly functioning judiciary system with only half of its courts being active, having resulted in tens of thousands pending cases each year. Furthermore, a very low level of the mining sector's income is distributed to the organizations and agencies enforcing mining polices (Carson et al., 2006). This theory is applied in order to discuss the government's capacity.

Implementation of a Ghana's environmental impact assessment (EIA) framework could serve as a good indicator of the government's capacity, specifically within the mining sector. Hilson et al., claim that the EPA, responsible for EIA is a *money-making machine* rather than an institution serving its purpose (2006, p.9). Thus, Hilson et al.'s theory will be seen in relation with findings concerning the EPA and its EIA implementation's adequacy.

In 1989, Ghana established the so-called Precious Minerals Marketing Company (PMMC) with the objective of increasing the governmental income from the small-scale mining sector, as well as facilitating a market for the small-scale miners. However, as both Hilson and Teschner claim, the organization does not only buy from the legal small-scale miners, but also from the *galamsey,* as have been shown in figure 3 (Hilson, 2003; Teschner, 2012). This theory is used in the analysis to further investigate whether it can be indicated that the Chinese *galamsey* are also selling to the PMMC. If this is the case, it might serve to undermine the government's interest in implementing the policies forbidding foreigners to conduct small-scale mining.

According to Hilson et al., excluding *galamsey* from participation processes, not recognizing them as stakeholders, have been a trend in Ghana (2006, p. 4-5). This theory is used to place and discuss findings regarding *galamsey's* inclusion or lack of inclusion in public process in the selected area of study.

As *galamsey* is predominantly seen as an alternative activity to farming, maximizing the latter's efficiency is crucial. Wegner's theory stating that the increasing potential of the efficiency of farming in Ghana is at 300% the current level, is used to shed light upon the effects sound governmental management of the farming sector can contribute to (Wegner, 2012, p.6).

Chapter 4: Methodology

4.1 Introduction

The research project can be characterized as having a case study design. In this section, it is firstly presented a brief overview of the qualitative and quantitative research methods as well as the mixed method approach. Following this comes a section on why the mixed approach was initially to prefer, and potential caveats the researcher generally needs to be aware of with regards to it. Further, there will be a presentation of the chosen methods; first those of qualitative character, then quantitative ones, as well as the reason for initially choosing them and why the latter was not applied after all. Lastly, the section will present the study's research design, sampling methods, data analysis as well as challenges and ethical evaluations.

4.2 Three Methodological Traditions

Quantitative methods are preoccupied with quantification in both the collection and analysis of data (Bryman, 2012, p.35). Further, the method can be characterized as deductive with regards to the relationship between theory and research, where testing of theories is the main focus (Bryman, 2012, p.36). Additionally, the method can be said to have an objective or positivistic character, and thus sees the social reality as real and objectively tangible (Bryman, 2012, p. 36). The latter is often contested, and a usual claim is that reality cannot be understood only through numbers the way aspects of the natural world *can* (Bryman, 2012, p.178). On the other hand, the use of quantitative methods can to a greater extent generate findings that are of higher validity and ability of generalization, if sampling is done in the proper manner (Bryman, 2012). The qualitative research methods are thus in many ways the opposite of the quantitative, and has an inductive nature between the theory and research, where the generation of the former is under focus. Opposing the quantitative method's positivism, the qualitative method takes a different epistemological position. It entails the seeking of individuals' interpretation of reality, where this is seen as the right way of capturing knowledge about the social world; which is something dynamic and ever changing not grasped by numbers (Bryman, 2012, p.36). In spite of these claimed advantages of qualitative method however, it is often argued by quantitative researchers that the qualitative nature of doing research leaves too much room for subjectivism and interpretation, which further diminishes the validity (Bryman, 2012, p. 405). The aspect of generalization is also

often termed as being opposite to the one of qualitative method; it is very difficult to achieve (Bryman, 2012, p. 406).

In 1959, Campbell and Fiske introduced the idea behind triangulation and thus in many ways formalized the use of mixed method research (1959). Whereas the former could also be used about the mixing of several methods within only one of the research traditions, the latter entails the mixing of both qualitative and quantitative methods. This combination could often have various advantages, and give the research a higher degree of validity, credibility and completeness to mention some (Bryman, 2012, p.633-634). The combination of the two can be done in various ways, where different application of the two can give different enhancements to the research, first and foremost through diminishing the link between findings and methodology.

4.3 Chosen Methods

In order to better grasp the topic under focus, the use of qualitative methods is a natural choice. Semi-structured interviews, observation and photographs as well as document analysis were thus applied in order to investigate the topic. Initially, the plan was to use a quantitative dataset for triangulation purposes, making the approach better defined as a mixed method. However, this dataset was not retrieved, due to challenges in field that will be put forth later in the method section.

4.3.1 Semi-structured Interviews

The semi-structured interviews are characterized by the researcher's important role in leading the interview process with well-defined questions, but at the same time encouraging for longer elaborative answers (Bryman, 2012). This approach was used for retrieving data from farmers, miners, officials, and random locals around the research issue. When applying this method, both focused questions and more open-ended questions, where reflection and longer answers from the informant was desired, where used (Bryman, 2012, p.470). Applying this method will usually have a higher response rate than for instance a self-completion questionnaire, as well as providing the advantage of being able to use follow-up questions and evaluate non-verbal indicators (Gordon, 1975). In order to ensure that all relevant information can be retrieved, the use of voice recording was applied.

When using this method, it is important to have in mind that its nature does not guarantee high reliability and validity, which could pose a threat to its credibility (Bariball, 1994). In order to limit this threat, it was stressed that the questions that were designed for the structured interviews, were not negatively nor positively charged. Furthermore, the coding of the answers was a central process, as it can highly affect how they will be interpreted. This is discussed further later on in the method section. Ideally, results can later be subject to respondent validation to increase their credibility, which entails the confirmation from the community members that the researcher has understood their views correctly (Bryman, 2012, p.390). This however, was not applied in the study, due to the challenges of traveling back and forth from the field. Most semi-structured interviews, with the exception of five, were done in Twi by the use of an interpreter.

4.3.2 Focus Groups

Initially, the use of focus groups was intended. Focus groups entail the interviewing of several people at the same time, where discussions amongst them often are encouraged (Bryman 2012, p. 501). The method could give valuable insight into how community members discuss the topic, and reveal their sentiments around it. Since the setting of such an interview could become more organic than a one to one setting, more realistic answers could possibly come forth. Additionally, the use of focus groups can be a much more effective way of conducting interviews than a one to one design, and thus give more data within the limited timeframe. A further argument for using focus groups is that it enables the interviewee's response to be contested by other participants, which could give the researcher data that to a higher degree represents what people really think (Bryman 2012, p.503). Potential challenges around the use of this method is the fact that the transcription of the sessions could become more difficult when there are several voices, and assigning right statements to the right person could be harder (Bryman 2012, p.504).

4.3.3 Observation and Photographs

Observation of physical traces has been applied extensively in the field (Bryman, 2012, p.325). This is argued to be the case due to observations done of the physical evidence from the Chinese *galamsey* activities. In addition, the mere observation of the physical impacts, as well as the environment and infrastructure in which miners, farmers and the government

undertake their operations, was useful for the researcher's understanding of the difficult conditions on ground.

4.3.4 Text and Documents

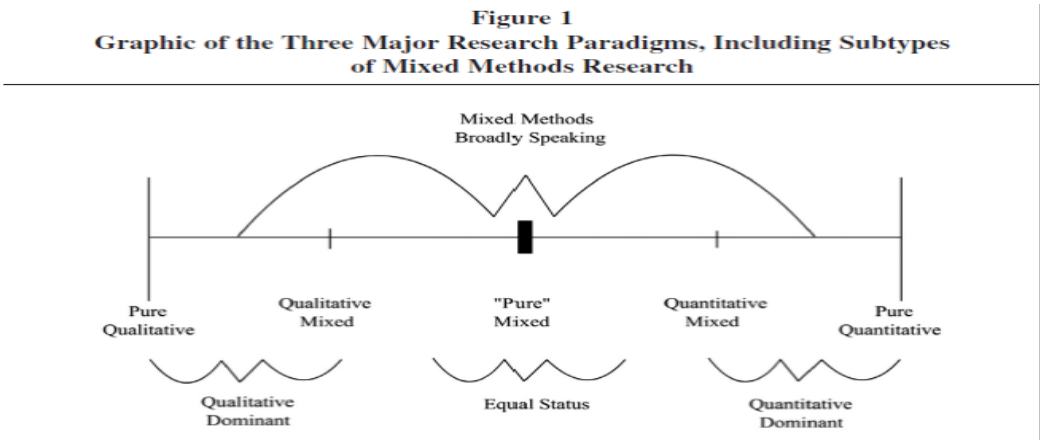
The Minerals and Mining Act of 2006 has been examined through the use of document analysis (Mining Act, 2006), and is thus applied as a source of data. The method was also used in analysing public data with regards to health, environment and mining in general, as well as several news articles and official reports.

Findings regarding work processes and environmental impacts were documented through the use of photography which is listed in the presentation of findings, serving both as data and for illustrative purposes (Bryman, 2012, p.547).

4.3.5 Why Mixed Method?

The reasons for initially choosing to use aspects of both qualitative and quantitative methods are mainly due to the nature of the data that was to be retrieved from the hospital. As longitudinal trends in symptoms were sought in the form of numbers, they qualify as quantitative data. Due to qualitative methods being the main way of gathering data, the project was intended to have a qualitative mixed character as seen in the below axis. Further, the order of the use of the methods was intended to be first qualitative then quantitative, which is classified by Bryman as QUAL>quan (2012, p.632).

Figure 8: The three major research paradigms



(Johnson 2007, p.124)

Caveats and criticism based around the use of mixed methods are however also present. Some are of the perception that using a quantitative method in a mainly qualitative study is not feasible due to the claim that methods are tied to their respective ontological and epistemological traditions (Bryman, 2012, p.629). In recent years however there has been a rising consensus that the methods can be used for many different purposes transgressing the limits of its tradition (Bryman, 2012). Also, in this study the use of quantitative data is only seen as a supplement to the qualitative method, to be able to increase the objectivity of conclusions made with regards to health effects from the mining. Thus, the researcher does not see it as a drawback mixing these two forms of datasets in the same research, but merely as strength and something that could add increased validity.

4.4 Research Design

A research design is to say something about how the research project is structured as well as its intended methods for data retrieval and analysis. In general, there are several established research designs that the researcher could choose from; comparative design, cross-sectional design, longitudinal design, case study design or the traditional experimental design (Bryman, 2012, p.45-77). This research project has chosen a case study design with elements of cross-sectional study, as a deeper understanding of the impacts of the illegal Chinese mining in Amansie West in the Ashanti region is sought; not a generalization to the whole country or continent (Bryman, 2012, p.66; Zainal, 2008). The character of a case study is the selection of a small geographical area where a topic will be investigated within its real life environment (Zainla, 2007, p.1-2). The chosen case will thus be seen in light of the mentioned theory, and not with the intention of changing it.

4.5 Sampling

Due to the character of the study, mostly semi-structured interviews have been used. As the research project is first and foremost an in-depth case study research project, generalization is not a priority, but comes second to the deeper understanding, which will reflect the chosen methods of sampling. Proper sampling is however still an important aspect, as it does affect the finding's external validity as well as credibility (Bryman, 2012).

4.5.1 Sampling Frame/method

The total sample size for this study using semi-structured interviews is nineteen respondents. Convenience sampling among local miners was used when seeking participants for these semi-structured interviews. The sample size for local miners was seven respondents, chosen through using the non-probability convenience sampling method, meaning that accessibility to respondents in the field determined who participated (Bryman, 2012, p.201). This was applied due to the already high challenge of getting access. Thus those informants being available within each category were applied. The use of this sampling method, as well as its size, does not enable generalization, but is to ensure a deep and wide understanding of the situation in that area (Bryman, 2012, p.418). The sub-sample division of miners is four miners working at a Chinese-run site, and three miners working at a locally operated site. The sample frame also included three random community members, not knowing if they were farmers, miners or sellers on beforehand. Further, the viewpoints of farmers were considered central in highlighting the issue, and thus, four farmers were chosen using convenience sampling. Additional to this, two Chiefs as well as the HR director of a small-scale mining company were also interviewed through the semi-structured interview approach. All mentioned respondents were used as sources for assessing the impact Chinese miners have on the communities as well as facilitating information regarding governmental action and support. Among miners, community members and farmers, questions aiming at uncovering policy-awareness were also asked.

As most impacts are to be felt by community members, being miners, farmers, or others, their sentiments serve as important expressions in grasping the situation. In order to get a more objective view of how *galamsey* affect workers health, a pharmacist in Kumasi was interviewed regarding what sort of drugs the *galamsey* mostly buy, also done through convenience sampling. This came in addition to some official data regarding health trends, in combination with various news articles. In order to retrieve findings regarding the government's handling of the issue, three official personnel were interviewed. This was done in combination with document analysis of various official reports, and news articles. An overview of all informants can be seen in appendix 2.

4.6 Data Collection

The fieldwork was conducted from January 10th to February 7th 2014. When the researcher arrived in Kumasi, he was taken good care of by the host family, which also consisted of the research assistant. They had already made some appointments, so data collection started just two days after arrival, not one week as intended.

The first week in the field started off by conducting semi-structured interviews, first testing the questions to ensure they were properly understood, then interviewing three local *galamsey* and two Chiefs. Originally, it was intended to apply the use of focus groups in order to fuse discussions around the topic, but due to the required 2 hour drive each way to the field, on very bad roads, and time restrictions on the part of the research assistant, this was not possible. The next step was to collect data regarding the farmers' view of the situation, and how they see the Chinese influx affecting them and the community. The sample size for the farmers was four respondents. In order to get the perspective of legally operating small-scale miners, a HR responsible of a small-scale mining company was interviewed. Additional to this, three community members were interviewed through convenience sampling from people in the centre of a small village.

The last day of the first week was spent interviewing four *galamsey* working at a different mining site that was run by the Chinese. Unfortunately, the Chinese were not present, and thus interviewing them was not possible. In-fact, the researcher saw quite few Chinese the whole stay, in line with some informant's responses that they are hiding in the nearby bush or Kumasi. Next was interviewing the District Chief Executive (DCE) of Amansie West in Manso Nkwanta. He serves as the leader of the district, and has newly taken office. Being a local and raised in the area, he was very engaged in the mining issue. The local hospital of Manso Nkwanta was then approached, in order to request the quantitative data, and making an appointment of delivery of those. Unfortunately, they were not able to provide the data before the researcher left the country, but was rather promised sent through e-mail later on. However, when having arrived back to Norway, it became clear that the quantitative data from the local hospital was not possible to retrieve after all, due to sudden requirements of payment for the release of them.

Lastly, the Police Director of Amansie West was interviewed to uncover more about what have been done directly to deal with the Chinese *galamsey*.

Due to the mentioned difficulty of reaching the *galamsey* areas, the interviews in Amansie West were finished the first week. Moreover, general talking about the matter with different locals was done the following weeks in order to get an impression of the general public's views. A lot of the transcription was also done in this period. As most interviews were conducted in Twi through audio recording, this did consume a lot of time. Thus the importance of starting transcription this early prior to departure from Ghana was proven advantageous. During the final week, two more interviews were conducted, this time, in Kumasi. An official from the Environmental Protection Agency (EPA) which is responsible for the Amansie West District was interviewed regarding the general impact of the Chinese *galamsey*, as well as what initiatives have been done by the government, also entailing the state of the current process of registering as legal miners.

4.7 Data Analysis

As qualitative method is the main tradition applied, aspects of the grounded theory approach were used. The most central aspect of the approach is the coding of data, which entails labelling or categorization of the data so that the content of it can be used for analysis (Bryman, 2012). This enabled the researcher to more clearly see which parts of the data that was salient to the study in question, also helping in seeing response trends as well as deciding what to focus on in the analysis (Bryman, 2012, p.568). The coding was done partly with pre-defined labels and categories the researcher defined while going through the text. In line with Taylor-Powell and Renner's advice, the labelling was focused on one subject or theme at a time (2003). This made the process more tangible as well as making it easier to spot the themes in the text when searching for one specific topic at a time and not twenty different ones. All the coding of the qualitative data was done using the online software "Deedoose"[2].

Since not only first-hand interviews were applied in this study, but also several news articles, academic articles and official sources, the analysis can be characterised as applying aspects of what Bazeley and Bryman call triangulation (2006). In order to achieve higher validity that is associated with method triangulation, but also to get a more complete picture; findings from first-hand interviews has sometimes been used in conjunction with other sources regarding the same indicators, to see how well they correlate, and thus be better able to draw conclusions

[2] http://www.dedoose.com/

from the findings (Bazeley, 2006; Bryman, 2012, p.392). The the qualitative content analysis method was applied when analysing various documents, such as newspapers and official reports was, which comprises searching out underlying themes which are often illustrated through quotes (Bryman, 2012, p.557).

At the transcription phase, which was the first step in the process of analysing the data, everything was written as precisely as possible, including grammatical errors, and incorrect sentence-structures. This also includes the transcripts based on oral translation by the research assistant, writing exactly what he stated to avoid a third influence on the primary data's outcome.

4.8 Ethical Evaluation/consideration

A central ethical implication when doing qualitative research is the issue of anonymity. Since the use of voice recording has been applied, this further increases the issue. In order to mitigate this as much as possible, the recordings were deleted as soon as they were properly transcribed, to increase the degree of privacy. With regards to photography, in cases where illegal miners are pictured, their faces have been censored, as it can potentially be used against them or cause them harm due to the activity's illegality (Bryman, 2012, p.135-136).

Informed consent entails the readily informing of participants and informants regarding the research project and its purpose, as well as making it clear that participation is fully voluntary (Bryman, 2012, p.138). However, the concept is a debated topic when it comes to research ethics, and although the norm is that it is to be retrieved from all participants this proves difficult in many situations (Bryman, 2012). Further, the definition of "informed" fuses more questions, as research projects often are highly complex and it could be too time-consuming giving every participant the full information about it. In fact, giving all information that exists on the research project could also bore the participants and limit their patience and willingness to be active participants (Bryman, 2012, p.141). However, the researcher did strive to readily inform all participants about the research project, their anonymity and that participation was voluntary. Due to the conversational nature of semi-structured interviews, combined with the fact that many informants were illiterate, the use of an informed consent form was not applied. Rather, the process was done orally, in Twi for informants with limited or none English proficiency, and in English for others, mostly official personnel. The

researcher was also of the perception that simply being a foreigner in illegal mining areas could in itself make respondents sceptical, a reaction that could have increased if requiring them to sign papers, formalizing the situation.

Another ethical challenge faced when in the field, was the enormous gap between the researcher's and the interviewee's socio-economic status. Being a student from a rich industrialized country, interviewing local rural Ghanaians regarding their income, and what effects their work has on the environment, was experienced as very uncomfortable. This is rooted in the fact that for many, subsistence mining was their only choice when having to provide for their families. Thus, the nature of the questions' formulation did sometimes provoke the feeling from the researcher's side that he was unrightfully accusing the workers of destroying the land and environment with their actions.

4.9 Challenges/limitations

When doing a research on the effects from Chinese mining, the chances are present that the researcher might be interpreted as taking one of the parties' "sides" so to speak. This however, did not seem to be a central issue when in the field. Using neutral questions perhaps mitigated this. However, no Chinese were interviewed due to difficulty of getting access, which could have proven to make this challenge more relevant.

The biggest challenge when in field was the language barrier. Although the official language for Ghana is English, most miners have no or limited English proficiency, and Twi was thus mostly spoken. These limitations were partly solved by using a research assistant serving as an interpreter. However, due to limited time in the field, and not wanting to take much of the miners' time, the assistant did not translate during the interview. Everything was recorded for later translation and transcription. This generated incidents where clarifying follow-up questions were not asked, which could have served to enrich the data. In addition, when transcribing, the researcher experienced how the interpreter initially tended towards summarizing, rather than translate word for word. This did improve gradually, but the risk of having some data losing its level of detail is present.

When applying qualitative methods, there is always the challenge of interpretation. All data was interpreted through the mind of the researcher and subject to his experiences, knowledge

and attitudes (Bryman, 2012, p.405), and thus diminish the validity to some extent. This was difficult to completely avoid, but the researcher genuinely sought to enter the research situation, as well as the transcription- and data analysis stage with an open mind.

Being a *bruni* (white man) was a major potential challenge the field. However, this was partly overcome by having three assistants of whom one was the community development planner, knowing the area and communities very well. The local assistants thus did most of the communication in Twi with the majority of the respondents. This was partly because most had limited English proficiency, but also due to the researcher's sentiments that locals' way of behaving towards *brunis* was very different to how they normally behaved. This challenge, combined with the language barrier as well as being unfamiliar with the culture and area, was the predominant reason for the absolute necessity of using the mentioned assistants. Having this dependence did prove to limit the amount of data retrieved, both due to financial reasons, but also due to the fact that the assistants had full time jobs they were unable to be absent from for a longer period of time. Thus, if having been a Ghanaian, data saturation could perhaps have been slightly higher and diverse, but access would still be an issue without the help of the community development planner, whose time was also limited.

Another challenge that was encountered in the field was the culture among officials, as well as other informants such as the Chiefs, to require money for agreeing to be interviewed. From a Norwegian cultural perspective, this is something which would be interpreted rather unusual, and associated with susceptibility to corruption, at least when done by official personnel. However, realising that this was the only chance to get access to some of the informants, and that it was seen as perfectly natural for my assistants, the payments were made even though it had certain ethical implications. However, as for the quantitative hospital data this challenge made it impossible to retrieve the intended data.

Chapter 5: Presentation of Findings

In this section, the findings will be presented. They are organized according to the research questions, where a presentation of the Chinese way of operating in the area is first presented. Then, following this is an overview of the environmental, social, and economic impacts. Lastly it will be presented what kind of relevant polices that are in place, their degree of implementation, as well as findings regarding government's capacity and what actions have been taken.

5.1 R1 – The Impacts of Chinese G*alamsey*

Through the semi-structured interviews with community members, *galamsey,* and farmers, as well as some official personnel and Chiefs, aspects of how the Chinese go about with their mining operations has been uncovered. Together with findings regarding environmental, social and economic impacts, they are here presented following a brief presentation of land ownership in Ghana.

5.1.1 Land Ownership - Traditional and Official

Due to Ghana's long history and traditional kingdoms, the rules of landownership are somewhat two-sided. According to traditional custom and law, the Ashanti King, and the local Chiefs administrate the land. This implies that all permissions to use, buy, or sell the land should be retrieved from one of these authorities. However, according to official law, and the 2006 Mining Act, Act 703, all land areas that are proven to contain valuable minerals, automatically falls under the government's ownership as below quoted from the act:

"1. Every mineral in its natural state in, under or upon land in Ghana, rivers, streams, water-courses throughout the country, the exclusive economic zone and an area covered by the territorial sea or continental shelf is the property of the Republic and is vested in the President in trust for the people of Ghana. (...) 2. Where land is required to secure the development or utilization of a mineral resource, the President may acquire the land or authorize its occupation and use under an applicable enactment for the time being in force" (Mining Act, 2006, §1-2).

In spite of this, according to the Chiefs the researcher spoke to, it seems like it is custom to not acknowledge the official laws as superseding the traditional system, and hence, Chiefs

regard themselves as authorized to delegate land regardless of what it contains. Thus, in some cases the Chinese go to the district Chief with money (sometimes 100 GHS and a shnapps) and request to use the land for their mining operations (Chief 2, Manso Koninase, 15.01.2014). In many cases, the Chief accepts the money, and lets the Chinese mine, regardless of the fact that the land actually belongs to the government:

"In Ghana, wherever there is minerals found, and it's documented, that land does no longer belong to the Chiefs, it belongs to the government. But the Chiefs will not follow these rules. Once the land is within their locality, they sell it to them illegally, cause it's an illegal thing. So the chiefs are also to blame for this illegal mining." (EPA officer, 31.01.2014)

However, according to a secondary source, the payment to enter the areas in this way is usually as much as GHS 20-30 thousand. It is also claimed that the Chinese sees all land as belonging to the Chief (unaware of formal land ownership laws) believing they operate legally with his consent (Myxter, 2013). In other cases, the Chinese might simply show up to the Chiefs claiming that they have already paid and gotten permission from the regional Chief. And as stated in an interview, the district Chiefs has no ability to control whether this is right or not. In-fact, doing so, can be interpreted as offensive to the regional Chief or even seen as a challenge (Chief 2, Manso Koninase, 15.01.2014). In addition to this, one Chief stated that some Chinese pay "taxes" to the government in order to be allowed to use the land (Chief 1, Manso Kwabenaso, 15.01.2014). Since small-scale mining is illegal to foreigners, it is reasonable to believe that "tax" in this case, means an amount of money paid as a bribe, thus acquiring the right to use the land through corruption. Hence, in addition to corrupt officials, the Chiefs play a significant role in how the Chinese gets accepted in entering the communities, in many cases driven by the offer of easy money.

5.1.2 Why the Chinese Miners Came to Ghana

According to a secondary source based on interviews of Chinese miners in Ghana, most of the Chinese *galamsey* are from the county called Shanglin in the Guangxi province in China. This was traditionally a gold mining area, and like Ghana, also experienced a gold rush in the 90s. However, the gold ores are supposedly dried out which have left many former miners unemployed. Thus, when a story in 2005 spread amongst its inhabitants that a local citizen had gone to Ghana bringing his savings of around USD$ 806,000 and returning with USD$16

million, interest for the country sparked. Thus, from then on, more Chinese started traveling to Ghana for gold mining, most of which also brought family or friends (Myxter, 2013). In 2013 it was estimated that people from Shanglin were controlling more than 1000 gold productions in Ghana (Song, 2013).

It is also reported that the Chinese government has been active in aiding people to go to Ghana for gold mining, handing out passports as well as sending mining equipment. In addition to this, most people who go to Ghana first retrieve the largest loan they are able to get, determined that they will be able to multiply the amount, and generate a profit. Further, as one Chinese reported in a secondary source, the trend is that most people followed this procedure because *"(...) everybody else did"* (Levin, 2013). Having indebted themselves severely, this naturally makes their determination to successfully complete the mining very high, thus explaining some of their persistence.

5.1.3 How Chinese Miners Acquire the Land

The Chinese first started coming into the Kumasi region in Ghana around 2009, reaching its peak activity in the mid 2013 (EPA Officer, Kumasi, 31.01.2014). The Chinese are said to operate in two different ways, where one is principally "legal", and the other is illegal. An EPA Officer, terms the two different kinds as *small-scale mining* and *galamsey* (illegal small-scale miners), thus portraying the former as legal. The latter operations are based on a partnership with locals, where the Ghanaians serve as labour force operating the machines, excavators and processing of the gold on land that the Chinese took or bought, being either forest-cover or farmland. The *small-scale* mining however, is principally legal, according to the EPA Officer, as here; the local is the one acquiring a valid license and permit to use the land for mining, while the Chinese simply offer the technology and knowledge (EPA Officer, Kumasi, 31.01.2014). This was also formulated by a Chief:

"The Chinese people don't have a license, they cannot get it. So it's the local people who gets a license, then they invite the Chinese people. The reason the local people do this is, one; knowledge, it's Chinese who has knowledge about how to do the work. Two; because of the machines, they have excavators." (Chief 1, Manso Kwabenaso, 15.01.2014).

These processes of doing illegal and so-called legal mining, was confirmed by community members from Manso Nkwanta, stating that the Chinese cooperates with Ghanaians in order to obtain the land for mining. They hire a local to approach the owner of a suitable farmland, and then offer him or her money for the land, not mentioning that it will be used for mining. The prices can vary a lot, depending on size, as well as the land's fertility. Land with lower fertility, gives less return to the farmer, which makes him/her more susceptible to sell for a lower price. The lowest reported price was GHS 5000 (Community Member 1, Manso Nkwanta, 16.01.2014). As an effect of having been confronted by armed forces and police, most of the Chinese now mine in the so-called principally legal way, cooperating with a local who gets the permit. This person would mostly get paid in the form of a percentage from the mining income. It is believed to be between 20-30% of the income (Chief 2, Manso Koninase, 15.01.2014). Hence, one officer from the EPA claimed that the Chinese working in this way, are only illegal miners because they do not cover the land, and due to using heavy machinery and often exceeding the designated 25 hectares (EPA Officer, Kumasi, 31.01.2014).

According to an Aljezeera documentary, corruption is also a highly central aspect of how the Chinese gets access to land. In an undercover investigation, it was revealed that the reporter (Ghanaian), by pretending to be a mediator for the Chinese, interested in doing mining, was able to get access from bribing the local District Commander in Accra with the amount of 200 GHS, which then equalled USD$120 (Anas, 2011).

5.1.4 Chinese Working-practices

Most Chinese working on unregistered land, conduct *galamsey* mostly by hiring excavators to dig up the designated area, and then hire locals to help them do the actual extraction of the gold. The digging is often a continuous process for the ten days the excavator is rented. This is due to the high cost of 1500 GHS for a ten-day rent. They usually dig in one place for 4-5 days, then move on to another close-by field while locals start washing/searching for gold in the pits (Community member 3, Manso Nkwanta, 16.01.2014). Thus, due to the fact that the machines are not owned by the Chinese, but rented for a rather high price, how effective they dig will significantly impact their marginal revenue. This drives them to dig up as much land as possible for the period the excavator is rented. This not only makes income higher, but also increases the degree of land degradation. Then, as reported in one case, the Chinese bring the sand with the gold to Kumasi where it is separated by using mercury (*Galamsey* 1 Chinese

site, Manso Nkwanta, 16.01.2014). Lastly, contrary to other informant's statements on the topic, locals working at the Chinese site in this study claimed to cover the land when they finish:

"I support whatever the districts officer will do, but what I'm asking for them is that they should talk to those doing the mining now, that whenever they finish they should level the ground. Here, where we work, we, the local workers cover the land again." (Galamsey 3 Chinese site, 17.01.2014).

In figure 9, a picture of the Chinese *galamsey* site and its excavators can be seen, whereas the camp, in which locals working for them live, is portrayed in figure 10.

Figure 9: Excavators at Chinese *galamsey* site

(Source: Author, Manso Nkwanta, 16.01.2014)

Figure 10: Camp for Ghanaian workers at Chinese *galamsey* site

(Source: Author, Manso Nkwanta, 16.01.2014)

5.1.5 Land Degradation

"Wherever the Chinese people worked over there, when they finished taking the gold, they don't cover anything"
(Community Member 3, Manso Nkwanta, 16.01.2014)

The most striking and prominent environmental impact of the Chinese *galamsey* is the land degradation. In addition to being former forest-cover, most of the land used for mining by the Chinese used to be farmland retrieved in the above-mentioned way (*Galamsey* 1, Manso Emmem, 15.01.2014). Findings further showed that the degree of Chinese land degradation, is similar to the impact from the local *galamsey.* However, due to the Chinese having more financial resources, they are able to rent excavators for more extensive periods, allowing them to dig up larger areas for gold extraction. Although, according to various local *galamsey*, the DCE as well as an EPA officer, the local *galamsey* did not apply machines such as excavators and bulldozers before the Chinese arrived. Thus the indirect effect of more environmental damaging general *galamsey* practices can be traced back to the Chinese:

"Until the advent of these Chinese, the galamsey activities wasn't large scale. Because the miners were using simple simple instruments. They were not using bulldozers, excavators. So it was the Chinese who introduces this idea of this. So, let's say, in about a week, if a Chinese miner settles here for, in about a week, the kind of devastating effect that will occur. Like, they clear everything on site. If they have the belief that gold is located here, it's cleared on site. Meaning, even if it is vegetation it's cleared, even if it's forest, its cleared. And water bodies, they don't care. So, they destroy everything. Everything natural or artificial, when it's gold located there, the Chinese mine there. And because they use these excavators, they can cause a lot of trouble." (EPA Officer, 31.01.2014).

Furthermore, a source stated the following:

"The difference is the use of equipment, heavy machinery. The Chinese are more heavily equipped. Excavators, bulldozers and other heavy equipment. That's the difference. You know, our people, the locals, would maybe only use picks and shovels to dig. But the Chinese are more sophisticated. (...) they are copying it." (HR responsible, Manso Nkwanta, 16.01.2014).

The *galamsey* practice today is often executed by stripping the land of all vegetation including the top soil, then digging at least 1 m of depth creating pits filled with water from which sediments are extracted (Asiedu, 2013, p.30). Both the local and Chinese site where data is retrieved, conducted the mining in this manner, using the described concentrate amalgamation method, first applying a sluice box and maths before using the mercury (*Galamsey* 3, Manso Nkwanta, 15.01.2014; *Galamsey* 1 Chinese site, Manso Nkwanta, 16.01.2014).

When local *galamsey*, community members, and farmers were asked about the environmental effects of the Chinese *galamsey*, hundred per cent replied that land degradation was one of them, thus being aware of the issue. According to several sources, the main issue is that the Chinese *galamsey* normally does not cover up the land when they are finished searching for gold at the site. One *galamsey* working for the Chinese expressed a rather high understanding of the activity's negative aspects:

"I would advise people for the future, then farming is the best. Because cocoa lasts for long. Trees can support a family for 20-50 years, but the galamsey is very short term." (*Galamsey* 3, Manso Emmem, 17.01.2014).

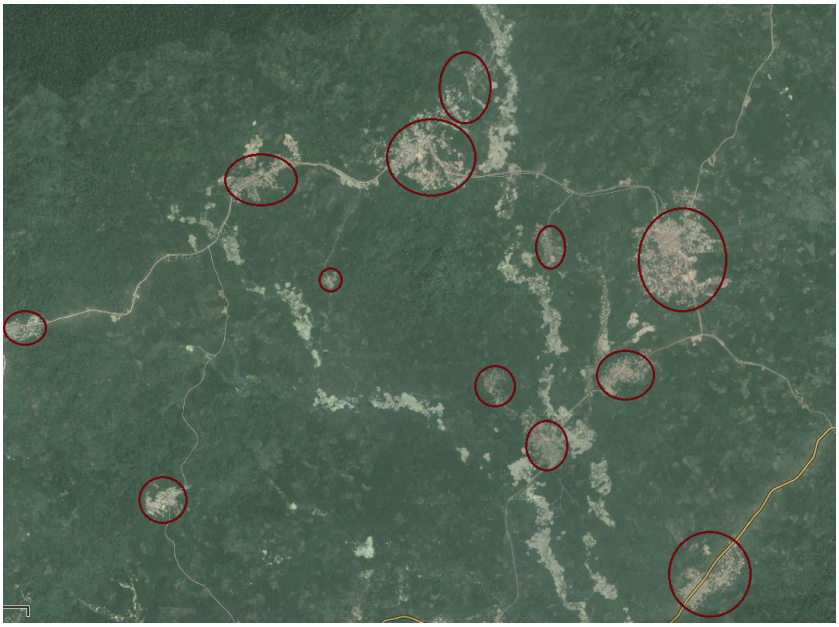
According to the Amansie West DCE, an estimated 30-50% of the farmland in Amansie West has been lost due to the Chinese *galamsey* (*Galamsey* Manso Nkwanta, 17.01.2014). An example of the extent of the natural impact can be seen in figure 11.

Figure 11: Degradation from former Chinese galamsey fields (photos taken from same point app. 180 degrees apart).

(Source: Author, Manso Nkwanta 16.01.2014)

Below is a picture retrieved from Google Earth, depicting Manso Nkwanta and surrounding areas. The circled areas are urban/cultivated areas, whereas the other altered areas (bright), are mined land. The picture is taken 01.08.2012.

Figure 12: Satellite image of Manso Nkwanta and surrounding areas



(Google Earth, 2014)

Further, total land degradation caused by *galamset* in Ghana in 2009 was according to Dr. Owosu-Sekyere from the Forestry Research Institute, estimated to be around 15 000 hectares, or 150 square km (Amansie West District Assembly, 2009). However, this is only 0.5% of the total degraded land caused by all mining[3]. Thus, as the legal small-scale mining sector accounts for around 20% of the total gold production of Ghana 0.5% seems very low, as 85% of small-scale miners are said to be *galamsey*. Thus, it might be more plausible that land degradation *galamsey* is in-fact even higher, making 15 000 hectares a modest estimate.

5.1.6 Water Impact and Mercury Pollution

When farmers, community members and local *galamsey* were asked about impact on water, 91.6 per cent replied that the water was destroyed due to the Chinese *galamsey*. One Chief replied the following:

[3] Total degraded land= 238 533 km^2 x 0.12 = 28 623.96 km^2. Amount caused by SM = (150km^2/28 623.96 km^2)x100 = 0.5 %

"Since they use mercury at the site, the mercury has destroyed the water, and it's also dirty. Those who are working over there are working close to the river site. (…) Since the Chinese galamsey arrived in our community, they have destroyed everything. One example is our water. Even the local galamsey now find it very difficult to find clean water to wash their sand. We used to have a river around the community, but the Chinese has destroyed it, so we cannot use that water anymore. For now, our source of water is two boreholes the government provided us. We also got another borehole from a company. So we have three bore holes." (Chief 2, Manso Koninase, 15.01.2014).

A farmer of the Manso Abore community gave this response to what the environmental effects of the Chinese *galamsey* are:

"Before the galamsey, when the farmer was going to his farm, he brought an empty bottle, because he knows that he could fetch water from the river on the way. But now the people of the community are crying for water, because the galamsey have destroyed it."
(Farmer 1, Manso Abore, 16.01.2014)

To a question regarding how the community was like before the influx of the Chinese *galamsey,* another farmer stated the following:

"Before the galamsey arrived, when you were going to farm, you didn't have to bring water, you could just take it from the rivers around the farmland. But now, this water is destroyed. We now buy water in the small plastic bags when we farm" (Farmer 4, Manso Abore, 16.01.2014).

Thus, the impact on access to water for the communities is severe, not only available water used for consumption and cooking, but also for farming, making the occupation even harder. However, the *galamsey's* impact on the water sources are not necessarily predominantly caused by mercury, but also as an effect of increasing sediment content, and diverting rivers, making it unusable for the locals. As the EPA officer stated:

"*From, I'm a water quality specialist. I take samples from the area. From mercury pollution, I cannot say is wholly true. Because they don't, now they don't normally use mercury. They use the gravitational method for extraction. And those who use mercury, especially the Ghanaians, the locals, the mercury is not used at the site. Even if it is at the bank of the river, they don't use the mercury there. They rather will start the process from there and then bring it home, to apply the mercury. So most of the water bodies, they are only coloured because of the clay. But if you test mercury presence, you get zero. They don't apply the mercury at the site".* (EPA Officer, Kumasi, 31.01.2014).

In line with this, it was confirmed by a worker at the Chinese-operated mine, that they do not use the mercury at site, but rather just the gravitational method, using carpets to filter out gold, then transporting it to Kumasi for mercury treatment (*Galamsey* 1 Chinese site, Manso Nkwanta, 16.01.2014). However, contrary to these findings, it was stated from the local-operated *galamsey* site, as well as the two Chiefs and the DCE, that mercury is generally used at the mining pits. Only having visited two sites for first-hand data on the use of mercury, this is not enough to generalize. However, it does illustrate that the *galamsey* does not necessarily use mercury at site, perhaps Chinese less than locals, while it also implies that the EPA officer's statements are not entirely correct. Below is portrayed a picture of miners at a local-run site using the concentrate amalgamation technique.

Figure 13: Miners at Ghanaian-run site using the concentrate amalgamation technique

(Source: Author, Manso Nkwanta, 16.01.2014)

5.1.7 Other Environmental Impacts

According to an informant, the intensification of *galamsey* operations has contributed to changing people's attitudes towards littering, and environmental consciousness (Farmer 1, Manso Abore, 16.01.2014). This however, is only reported by one respondent, and is thus not enough to draw any conclusion. Also, it falls outside the scope of this project, but looking at the relationship between increased *galamsey* and environmental consciousness could be a valuable separate study.

5.1.8 Household Characteristics

In the following sections the social impacts that can be related either directly to the Chinese *galamsey*, or the increased local *galamsey* as an effect of the Chinese influx, will be presented. First, is an overview of average household characteristics of respondents, as can be seen in table 4.

Table 4: Household characteristics of informants

Household Characteristics of Respondents	
Average Household Size	Average Nr. of Children
8	3,3
Household Characteristics of Miners	
Average Household Size	Average Nr. of Children
7	1,3
Household Characteristics of other community members	
Average Household Size	Average Nr. of Children
9	5,0

(Source: Author)

The average household size in Amansie West is 5.2, where children constitute 2.3 of those (Ministry of Food and Agriculture, 2013). Thus, respondent's household size and amount of children is higher than the district average. From this data, it is clear that miners, with their average amount of children at only 1,3, while still having average household sizes of 7, in general are in a phase of their life where they have not established their own families. Thus, their income is most likely used to provide for their extended family, siblings and parents.

5.1.9 Chinese - Local Relationship

According to various sources, the Chinese are said to predominately keep to themselves, not socializing much with the local population. Mostly living in Kumasi, or the bush, they don't

even talk to the local's when they come to the villages. It is even said that some makes their Ghanaian workers go to the village to buy stuff for them:

"The Chinese don't come here to live; they just work here, and stay outside the community. They should have come and stayed here, so that we could have told them what we need, so that they also could support us as the local galamsey does. Since they live outside it is very difficult to talk to them. Some Chinese even live in the bush where they work, and never come to town. So I don't support that the Chinese do the galamsey, since they do not benefit us." (Community Member 2, Manso Nkwanta, 16.01.2014).

Further, there have been several clashes between aggravated locals and Chinese, where the latter is often armed. In the case of Amansie West, this has so far not lead to anyone being killed. Recently, in 2013, there was a major clash in the Siana community that was fuelled by local's disagreement of the Chinese practices (DCE, Manso Nwkwanta, 17.01.2014).
In addition to this, it is reported that local gangsters and criminals often tend to target Asians, now regardless of whether one is a miner or a restaurant owner (Huifeng, 2013a). A Chinese miner stated in a news article the following:

"'*We are frequently threatened and robbed by local gangs, and also need to bribe local officials and policemen in return for necessary cover. The Chinese embassy in Ghana only has 10 Chinese employees and is little help when we are robbed and even killed. (…) To protect ourselves, we buy shotguns to deter the robbers. But I have never shot anybody, even though my site has been robbed twice.'"* (Huifeng, 2013b).

Through another news article with a Chinese perspective on the situation, it is reported that Chinese miners in specific have been harassed by both crooked police officers and armed bandits, where the latter combined with local residents have attacked camps armed with machetes and guns, executing theft as well as killing some in their way (Levin, 2013).

5.1.10 School Attendance and Youth Autonomy

The findings, both through interviews as well as observation, showed that practicing *galamsey* is primarily an activity done by the youth. The average age for informants who were miners was 28.5 years. When farmers, of which had an average age of 47, where asked why they did

not do the *galamsey*, most replied that it was because of their age, which paired with the extremely hard work mining is; made them unfit to practice it. The same respondents did however also reply that *galamsey* is first and foremost negative for the society and environment, more so than a positive activity.

According to one Chief, the increased trend in doing *galamsey* for the youth, of which many initially attend school simultaneously, have contributed to a high degree of school dropouts. This is stated by several respondents, of which one formulated it in this manner:

"Illegal mining or galamsey, is not good work for people to do. Because all the youth don't want to go to school, they all want to work at the galamsey site. ".
(Farmer 3, Manso Abore, 16.01.2014).

This is further supported in a news article regarding school performance in Amansie West posted in the Ghana News Agency:

"The school children, especially those in Junior High School's (JHS) reportedly, stopped attending classes immediately they register for their Basic Examination Certificate of Education (BECE) and rather join their siblings and mothers in the deep pits to look for gold. (...) the performance of schools in the district dropped significantly from 78 per cent in 2009 to 51 per cent in 2010, as a result of poor performance from schools in galamsey communities in the area." (Tetrem, 2010).

This shows that the decline in school performance in the district highly correlates with the increase of Chinese influx that is reported to have started in 2009 and peaked in 2013.

This shift from education to *galamsey*, which enables the youth to have their own income, and thus be autonomous to the family, is reported to contribute to a lack of respect by the youth: *"So things have changed. Even, the youth, they no longer respect anybody, because they now have their own money."* (Farmer 1, Manso Abore, 16.01.2014)

As seen in the picture below, in line with the data, all *galamsey* workers are young. In the lower right of the picture, it is also exemplified what is often the case when female *galamsey* become single mothers; the child is exposed to the mining environment and its potential

health hazards like mercury through air pollution. The baby pictured here was even stated by its mother to be sick, possibly due to the mercury they used on site (*Galamsey* 2, Manso Nkwanta, 15.01.2014).

Figure 14: Ghanaian-run *galamsey* site

(Source: Author, Manso Nkwanta, 16.01.2014)

5.1.11 Teenage Pregnancy

"First of all, it is an undisciplined life, it means that those working at the sites don't respect anybody. And they dropped out of school to go to galamsey. Even those who are still in school, go straight to the galamsey place after the school is finished. They don't read or do their homework. Because of that, a lot of teenage pregnancy has increased. So girls aged 14, 15 and 18 all give birth now. One example is when I went to hospital close by. I then saw a 14 year old girl coming to the hospital with her baby. I went over to her and asking if the baby belongs to her mother. She said "no, it is my child. The father is a junior high school boy."" (Chief 1, Manso Kwabenaso, 15.01.2014).

As seen in the above quote, the decline in youth education, and the active choice of doing *galamsey* instead of homework or even school attendance, is attributed to be one cause of increased child pregnancy. It was mentioned that girls between 14 and 18 years regularly get pregnant these days.

In addition to this, it was mentioned that there are cases where the Chinese come in and impregnate local girls, then vanish without taking responsibility, thus causing a higher prevalence of single mothers (DCE, Manso Nkwanta, 17.01.2013).

5.1.12 HIV Prevalence

As stated by the DCE of Amansie West as well as a local Chief, the prevalence of HIV is always higher in a *galamsey* community than outside it (Manso Nkwanta, 17.01.2014). This is mentioned to be the result of a large influx of people from outside the community coming in for shorter periods. When this combines with a large concentration of youth with low education, HIV can easily spread (Carson et al., 2005, p.44). This is supported by a local Chief stating the following:

"I have visited the hospitals, discussing issues with nurses, and what they say is that the HIV virus is in our community now, because of a lot of people coming inside. The strangers who come and work over there, will never come there with their own name. They come with a different name. So when they finish and disappear, it will be very difficult finding that person again." (Chief 1, 15.01.2014, Manso Kwabenaso).

In addition to this, data retrieved through a news article by a Ghanaian journalist states that as much as 116 new infections have been recorded only the first half of 2012 in the Amansie West District, said to predominantly be caused by the increased *galamsey* activity (Tawiah, 2012). If one assumes that the prevalence was the same the other half of 2012, making it 232 in total, the increase is as much as 134 per cent[4] from the 2009 numbers that only amounted to 99 cases (Amansie West District Assembly, 2012, p.17). These years between 2009 and 2012, constitute the timespan where the Chinese *galamsey* in the district experienced its dramatic increase. Thus, it could be the case that this trend is attributed to the increase of Chinese *galamsey*, which as shown also have increased the prevalence of Ghanaian *galamsey*.

5.1.13 Direct Health Effects from the *Galamsey*

"Since the galamsey is very hard work, when you come home, you have to take a painkiller. So the youth are even getting unhealthy and old because it is so hard work and taking painkiller every night." (Farmer 3, Manso Abore, 16.01.2014).

[4] (232-99) / 99 = 1.34 x 100 = 134 %

As previously described, the health impacts of practicing the *galamsey* can be various and severe. One of the direct, most obvious impacts is the fatigue and pain caused by the very hard work. Through an interview with a pharmacist in Kumasi, it was uncovered that a lot of miners come to buy medicines there. Most of which are painkillers, sleeping tablets and malaria medicine:

"What they mostly buy, is painkillers and malaria drugs, as well as sleeping tablets. When we ask them why you buy the sleeping tablets, because if you eat well in the evening, you can sleep, they say that because of the work they do is so hard, when they go to bed they can't sleep. There's one community called Wasa Ekuropong, where they have about 30-40 chemical/medical shops over there, this is a galamsey community. Whenever they go there, they buy a lot of products, mostly painkillers and malaria drugs. Whenever they want to buy blood tonic, they ask if it will make them sleep well. We don't give them normal sleep tablets without prescription."
(Pharmacist, Kumasi, 27.01.2014).

Practicing *galamsey* on a daily basis also contributes to increased mercury exposure, which in many cases leads to respiratory deceases (Lebel, 2003; Veiga et al., 2006). Looking at official data on the Amansie West's most common health issues, acute respiratory infection climbed from being the 4th most prominent illness in 2008 to being second in 2009, only passed by malaria as the most common health issue (Amansie West District Assembly, 2012, p. 16). It rose from 2,497 cases to 3,972 cases, thus increasing with 59 per cent[5]. Of these 3,972 cases, only 7.1 per cent received treatment. This year, 2009 is the year where the Chinese influx started, and thus there can be said to be a correlation between an increase in Chinese *galamsey* and the health impact which is most attributed to mercury pollution.

Additional to these mentioned impacts, it is reported to be the case that several people have died as a consequence of falling into the uncovered pits filled with water, or due to the pits caving in when people are working in them (Anas, 2011). In Amansie West, one woman recently died being a victim of the latter, leaving her child and husband behind. The pits these locals are working in are often abandoned Chinese pits, of which locals who are unable to partner with them, hope to find some gold (Peace FM Online, 2014). The last quarter of 2013

[5] (3972-2497) /2497 = 0.59 x 100 = 59 %

and January 2014 combined, a total of 17 people have lost their lives in Amansie West due to falling into pits (Tawiah, 2014).

5.1.14 Malaria

Malaria mosquitos are known for breeding at still water, and thus leaving hundreds of pits uncovered filled with water, can greatly contribute to an increase in malaria in an area (Hilson 2002, p.65). Pits like the one below were often spotted in the field.

Figure 15: Example of pits causing malaria

(Source: Author, Manso Nkwanta, 17.01.2014)

Looking at official data retrieved from the Ghana Health Services Manso Nkwanta in an Amansie West District Assembly report, the amount of reported malaria cases increased from 29,244 in 2008 to 36,097 in 2009 (Amansie West District Assembly, 2012, p.16). This is a 23.4 % increase in one year[6]. Although, this is data only based on two years, it also correlates with the increase in Chinese *galamsey* seen between 2008 and 2009.

5.1.15 Economic Impact on Farmers

In this and the following sections it will be presented various findings that can be determined as significant for altering the socio-economic situation of the inhabitants of the Amansie West District.

[6] (36097-29244) /29244 = 0.234 x 100 = 23.4 %

The average income for farmers that was interviewed is GHS 750 a year, or USD$ 254[7], around $40 more than the district average[8]. This equals an average monthly income of just 62.5 GHS. Both of the two farmers who were asked if their income had declined the past five years, confirmed that it had, and that it is now lower than what they have to pay in school fees for their children (Farmer 1 and Farmer 2, Manso Abore, 16.01.2014).

The most significant economic impact that can be said to be traced back to the Chinese *galamsey*, is the short-term increase in financial holdings which occurs when they decide to sell their land to the Chinese. As reported in two cases, GHS 5000 was a normal price for the farmland they sell, thus equalling around 6.5 years of the farmers income. The money is stated to be used for either education for their children, so that they will have the necessary graduate in their family, or for an extension on their house (*Galamsey* 2 Chinese site, Manso Nkwanta 15.01.2014). Another respondent formulated the situation in this manner:

"When my parents sold the land to the Chinese for GHS 5000, they don't get any money from anywhere. Now, they have already used it all. Before they sold the land, they used to plant beans and garden eggs they got money every weekend. I think farming is better than selling your land to a Chinese galamsey." (Community Member 1, Manso Nwkanta, 16.01.2014)

It was also replied that some families has two or three lands, so they keep one or two for farming after they have sold one of them (Community Member 2, Manso Abore, 16.01.2014). The money they receive from the Chinese for the land can however be drastically lower. Especially in situations where the farmers' land is deemed infertile, which in many cases is caused by the pollution of the water from the nearby land that has already been sold for mining. This creates a situation where the Chinese with money are able to spread very easily as neighbouring farmers get desperate for income (Farmer 4, Manso Nkwanta, 16.01.2014). Some are even so desperate that they approach the Chinese themselves, expressing that they want to sell their land (*Galamsey* 3 Chinese site, Manso Nkwanta, 17.01.2013; Farmer 4, Manso Abore, 16.01.2014).

[7] Using XE Currency Converter's rate of GHS 1= USD 0.339848. Retrieved (21.05.2014) from: http://www.xe.com/currencyconverter/convert/?Amount=1&From=GHS&To=USD
[8] USD$230 (Ministry of Food and Agriculture, 2013)

Some people also saved most of the money they got from selling the land. However, poor quality of the financial institutions was stated to be an issue. This is made clear in one quote:

"After our parents sold the land to Chinese people, some saved their money at the local micro-finance institution, and one issue is that these banks work 6-7 months before they are out of business. So suddenly the money are gone. This happened to my parents. Because of that, some of the farmers don't have money now." (Community Member 2, 16.01.2014, Manso Nkwanta).

This implies that the potential for land payments to have a more sustainable economic effect on the farmers is limited due to the poor financial services available.

5.1.16 Economic Impact on Miners

Findings reveal that, in general, miners working for Chinese operators earn more than those not affiliated with them (DCE, Manso Nkwanta, 17.01.2014). According to Ghanaians working at a Chinese site, they can earn somewhere between GHS 1000 and GHS 2000 a month working as machine operators or washing of the sand/gold. Another worker at the same site reported that he earns GHS 10 pr. hour, and sometimes work up to 10 hours a day. With an estimated 24 working days per month, this becomes GHS 2400 a month. It is thus reasonable to believe that the average working day is not less than 7.5 hours, which will give a minimum income of around GHS 1800, slightly more than median of the span of GHS 1000 and GHS 2000 stated by the other informant. This is 80% more than the reported monthly GHS 1000 equipment operators of a lawful bigger small-scale company earn (HR responsible, Manso Nkwanta, 16.01.2014). In general it seems that the Chinese are enabling the locals to get better access to the minerals due to the technology and knowledge they have introduced:

"Economic wise, to get money; yes. Because, they depend mostly on the Chinese to have access to whatever they want to mine (...) " (EPA Officer, Kumasi, 31.01.2014).

Further, as quoted in a news article, Chinese workers earn around the same amount even when working only as equipment guards at Chinese-operated mines. The amount quoted was

4000 Yuan, the equivalent of GHS 1887[9] (African News, 2013). By two different sources however, it was said that Chinese working as machine operators earned around 10 000 Chinese Yuan per month, or GHS 4719[9], which amounts to GHS 52 044 a year (African News, 2013; Hefeng, 2013b). This is in line with a third source, which state that it is often the tendency that the Chinese earn much more than locals working at their operations. The Chinese were here reported to earn USD$ 16,000 annually, equalling GHS 47 080[10] or GHS 3923 a month (Jiao, 2013).

According to one *galamsey* not working at a Chinese site, their income has increased the last five years (*Galamsey* 2, Manso Nkwanta, 15.01.2014). Now, the three informants from a local mining site reported a span between GHS 40-70 a day, or GHS 1080-1440 a month assuming it contains 24 working days. This constitutes an average income of GHS 1360 a month. It was also uncovered that women in general get less paid than men, since they are often the ones doing the washing of the sand/gold, thus earning around GHS 30 a day as responded by one interviewee (*Galamsey* 3, Manso Nkwanta, 15.01.2014). An overview of the different income groups of miners is listed below in table 5.

Table 5: Overview of *galamsey's* income

Miners (machine operators)	**Circa monthly income (GHS)**	**Circa Annual Income (GHS)**
Ghanaians at Ghanaian-run sites	GHS 1 360	GHS 16 320
Ghanaians at Chinese-run sites	GHS 1 800	GHS 21 600
Chinese at Chinese sites	GHS 3923 – 4719	GHS 47080 – 56628
Ghanaians at legal SM-company	GHS 1 000	GHS 12 000

(Source: Author)

Thus, from the table, one can see that Chinese machine operators generally earn 118-162%[11] more than the Ghanaians working for them, and that Ghanaians working at Chinese operate sites earn around 32%[12] more than those working at sites run by locals.

[9] Using XE Currency Converter's rate of CNY 1= GHS 0.471918. Retrieved (21.05.2014) from: http://www.xe.com/currencyconverter/convert/?Amount=1&From=CNY&To=GHS

[10] Using XE Currency Converter's rate of GHS 1= USD 0.339848. Retrieved (21.05.2014) from: http://www.xe.com/currencyconverter/convert/?Amount=1&From=GHS&To=USD

[11] (3924-1800) / 1800 = 1,18 x 100 = 118 %. (4719-1800) / 1800 = 1,62 x 100 = 162 %.

[12] (1800-1360) / 1360 = 0,32 x 100 = 32 %.

According to one interviewee from a secondary source from 2003, the sentiments of wanting to increase mining efficiency and start using machines, was present among locals before the influx of the Chinese. One secondary source respondent said the following:

"'Most of our mining techniques are manual, so they cannot generate enough money to open up the [gold mine] works … but if there is money to come, we could progress to semi-mechanic by purchasing pumps and washing machines so production would increase. … Then we could purchase more equipment and hire more hands.'" (Hilson, 2003).

Hence it can be argued that the presence of Chinese *galamsey* have in one way injected the capital and expertise in the illegal small-scale mining sector that was needed to make it more effective and income-generating.

5.1.17 Economic Impact on Community in General

Findings related to the economic impact on the general community are several. Perhaps the most significant change is that the prices have been rising, due to several mechanisms here presented. It was reported by two sources that the price of plantain (most common vegetable) had been rising after the Chinese influx, respectively they stated the raise to be GHS 2 - GHS 3 and GHS 2 - GHS 7 (Community Member 1, Manso Nkwanta, 16.01.2014; *Galamsey* 3, Manso Nkwanta, 15.01.2014). This is an increase of 50 to 250 per cent[13]. The Chinese *galamsey*, who now hires locals, naturally earns a lot of money. This makes them able to pay whatever prices the shopkeeper asks, and thus according to basic theory of supply and demand, the prices are raised. This combines with the reduced farming output in the local community due to the altering of farmland to land for mining. This limits supply, and in addition to raising prices, has created a situation where many go to the city to buy their foodstuff instead of actually going there to sell (EPA Officer, Kumasi, 31.01.2014).

The situation is well covered by a quote from one *galamsey*:

"It depends, for example when it comes to plantain, the prices has increased from GHS 2 to around 5-7 GHS. This is because less people are farming, which makes less plantain available. Also because the Chinese pay anything you ask for this. The raining season is

[13] (3-2) / 2 = 0,5 x 100 = 50 %. (7-2) / 2 = 2.5 x 100 = 250 %.

good, because then the prices go down. Another reason that the prices raise, is that many people have travelled here to work in the galamsey. Because of that, the supply is too low, and the prices go up, so we have to buy things outside, in Kumasi."
(*Galamsey* 3, Manso Nkwanta, 15.01.2014).

Thus, the issue is not only decreased supply, but also increased demand due to the influx of people, predominantly for doing *galamsey*.

It is also clear that when Ghanaian *galamsey* start earning a substantial amount of money, it is contributing to the well-being of the whole community. One community member reported that the local *galamsey* have cooperated on paying for a new bridge in the community (Community Member 3, Manso Nkwanta, 16.01.2014). These effects can be claimed to partly result from the increased income generated when using excavators and bulldozers, which the Chinese introduced. Thus, due to these effects, in combination with the increased demand which benefit those selling things, there are also sentiments that the Chinese should be in the area, and in-fact ought to live there rather than in Kumasi or the bush, to benefit the community further:

"A lot of people like the Chinese. Because if you lead or help them, they will pay you. One of the problems though, is that they don't employ a lot of people. The work that actually needs 10 people to do, they would employ only 4." (Community Member 3, Manso Nkwanta, 16.01.2014).

This was supported by the EPA Officer who said the following*:*
"So even when the task force were formed, and they were driving the miners away. Within the next one month, the villagers started crying, that they wanted them back. Most of the Chiefs there, they were saying that we should allow them to come back." (Kumasi, 31.01.2014).

This former quote also indicates the sentiment that Chinese operate with harsh working conditions, as they use less than half of the workforce for a given operation, than what is deemed suitable.

It was also stated by one respondent that as much as half of the community members are doing *galamsey* now, which secures all families economically (Community Member 3, Manso Nkwanta, 16.01.2014).

Lastly it has been reported by a representative of the Chinese Mining Association in Ghana, that an estimated 40 per cent of the 3.6 million ounces produced in the country in 2011, originates from mines operated by people from Shanglin (Song, 2013). Of these 3.6 million ounces, 254 050 ounces were exported through the PMMC, as can be seen in appendix 1 (PMMC, 2012).

5.1.18 Social Responsibility

When interviewing *galamsey* working at a Chinese site in Manso Nkwanta, it was stated that the Chinese have engaged in some sort of social responsibility initiatives. When the community enquired the Chinese about support for a generator in a clinic, they received GHS 5000 to buy it. They have also received GHS 2500 for a road construction, and GHS 10 000 for a school block as well as providing the community with a water pump (*Galamsey* at Chinese site 3, Manso Nkwanta, 16.01.2014). This is partly supported by a community member from Manso Nkwanta who stated that: *"The Chinese illegal mining has changed our community, because they paid money for a road construction over there."* (Community Member 3, Manso Nkwanta, 16.01.2014).

Another informant, a Chief, explained that the Chinese do provide some help with community development, but that it is a long and tedious process to achieve this.

"When the Chinese people were around, the problem we were facing was that the Chinese would never come to you and tell you that they want to do anything for the community. We have to go them ourselves and ask them if they can contribute. Sometimes, it becomes an argument between the leaders and the Chinese people. If we ask the Chinese if they can make a borehole for us, they refuse because of what they have to pay to do it. One problem is that, sometimes it is very difficult to talk to a Chinese directly, since we never see them. We have to talk to a local who are leading them, they will inform the Chinese people what the community needs. This makes it a very long process, so if we need something from them, we have to wait weeks, maybe months before we get an answer." (Chief 1, Manso Kwabenaso, 15.01.2013).

5.2 R2 – Why the State Fails in Solving the Situation

In this section findings related to how the government has tackled the *galamsey* issue is presented. This is followed by a presentation of potential challenges to the implementation of dealing with the issue, as well as implementing the general small-scale mining policies. First off, a general overview of the state of mining policies, the process of registering as a miner, and the level of policy awareness, is presented.

5.2.1 Small-scale Mining Policies in Ghana

Currently, it is the Minerals and Mining Act 2006 that is enforced in Ghana regulating the SM sector. In implementing these policies, there are essentially five institutions carrying the main responsibility. The Minerals Commission is responsible for the overall implementation and coordination of the policies, while its sub-institution; Inspectorate Division is enforcing the Mining Regulations from 1970 regarding health and safety in mining operations. The Forestry Commission and The Water Resources Commission also play a significant role, as approvals from both are required in order to conduct mining. The overall responsibility for environment in relation to mining however, is carried by the environmental protection agency (EPA). Their role entails the enforcement of environmental laws under Environmental Assessment Regulations from 1999, which comprises applicant requirements such as filing a scoping report of environmental impacts (EIA) and essential issues that are to be part of a public hearing and review. However, there are no clear regulations as to how good environmental practice in small-scale mining is to be conducted, only requirements for completing the EIA (UN, n.d.b, p.15-18). For instance, there is no mention of requirements to apply retorts when heating the mercury amalgam (Mining Act, 2006; Environmental Assessment, 1999; Mercury Act, 1989). The EPA is further authorized to sanction any breaches to the permit, where withdrawal of the latter or prosecution can be the means. Lastly, the Lands Commission is responsible for the management, as well as valuation of land in cases where compensation is necessary due to forced redistribution of that land to a mining grant (UN, n.d.b, p.15-18).

A small-scale mining licence normally lasts for five years, but may be renewed for a period decided by the Minister. According to the Minerals and Mining Act 2006, registered miners are obliged to pay a 25% tax and royalties ranging from 3-6% (Mining Act, 2006, p.14). However, this was raised in 2010 through an amendment setting the tax rate at a constant 5%, much due to companies taking advantage of loopholes and only paying the minimum of 3%

(Gajigo et al., 2012, p.1). Mining is to be conducted by observing good mining practices, without having clearly defined what this entails, as well as abiding good health and safety rules and pay attention to the protection of the environment (Mining Act, 2006). According to paragraph 99, if small-scale mining is done without being licenced the individual or group is liable to a fine of 1000 penalty units, no more than 3 years of imprisonment, or both. It also states that by dealing in minerals without a licence, one is liable for a fine of 3000 penalty units, 5 years of imprisonment, or both (Mining Act, 2006). In order to be defined as small-scale the designated mining area cannot exceed 25 acres (Hilson, 2001, p.9).

When small-scale mining was formalized in 1989, through the Mercury Law and Small-Scale Mining Law, the described PMMC was also created, responsible for buying gold from the registered small-scale miners. However, it is widely known that they do not limit themselves to registered miners, but also buy from the *galamsey* (Carson et al., 2006; Teschner, 2012, p.310). Totally there are around 800 buying agents on the ground purchasing from operators in both sectors (Hilson, 2003), which combined contributes to the organization's (hence government's) income, which in 2011 was GHS 393 million (PMMC, 2012).

With regards to the discussion in section 6, it is conducive to put forth the paragraph that is to hinder the Chinese from conducting small-scale mining:

"83. A licence for small-scale mining opertion shall not be granted to a person unless that person (a) is a citizen of Ghana, (b) has attained the age of eighteen years, and
(c) is registered by the office of the Commission in an area designated under section 90(1)."
(…) *'Citizen' means,*
(a) an individual who is a citizen of Ghana by virtue of a law for the time being in force in Ghana; (b) a partnership or association which is composed exclusively of individuals who are citizens of Ghana; (c) a body corporate which is incorporated under the Companies Code, 1963 (Act 179), and

(i) which is certified by the Minister to be controlled by the Republic,
(ii) whose membership is composed exclusively of persons who are citizens;
(iii) whose directors are exclusively citizens,
(iv) which is controlled by individuals who are citizens (...)"

(Mining Act, 2006, §83)

5.2.2 The Process of Registering as a Small-scale Miner

After the influx of the Chinese, an increasing number of locals have started doing *galamsey*. Therefore, a presentation of what is currently needed to become a registered, and thus more sustainable miner is here presented, as a low registration-rate is seen as worsening the impacts.

If you want registered as a small-scale miner in Ghana, the first thing you need to do is to approach the Minerals Commission where you will receive an application letter, which forwarded to the District Assembly. The District Assembly informs the public in the relevant community, by publicly displayed writings. If, by 21 days, there are no objections from the general public to allowing mining in the area, one receives a written confirmation that the District Assembly and the local population accept mining in the relevant location. Following this, you need to buy a form from the EPA for GHS 5, which contains questions regarding environmental and community impacts, where it is located, the name of the company, as well as some planned mitigation initiatives to deal with the impacts. This form is then returned to the EPA together with the letters from the Minerals Commission and the District Assembly. Then, if papers are satisfactory, and there have been no objections, one receives a permit from the EPA. Lastly, this permit has to be taken to the Minerals Commission in order to get issued a mining licences/permit (EPA Officer, Kumasi, 31.01.2014). By examining the Minerals and Mining Act 2006, it is seen that the maximum administrational time to be allowed spent by the government in issuing a permit, is 150 days (Mining Act, 2006, §12, 13-1). However, now it usually takes more than a year due to bureaucratic delays, where most of this occurs at the Minerals Commission (EPA Officer, Kumasi, 31.01.2014). According to the official document regulations from the EPA, it is stated that there is a permit fee of GHS 750 in the case of operations with a minor impact, and GHS 6250 plus an additional GHS 270 for small-impact proposals (Fees and Charges, 2013). In addition to these mentioned fees, it is said that there is a flat rate of USD$2240 (GHS 6713[14]) for the first year, and USD$ 560, (GHS 1519[13]) for each subsequent year, which is to be paid to the District Assembly (Tschakert & Singha, 2007, p. 1306). Thus, the total cost for the permit (including fees for the first year) for a minor-impact permit is GHS 7463. For a small-impact permit it is GHS 13 233.

[14] Using XE Currency Converter's rate of USD$ 1 = GHS 2.996. Retrieved (28.05.2014) from: http://www.xe.com/currencyconverter/convert/?Amount=1&From=USD&To=GHS

Several respondents claimed the process and costs currently required to become a registered miner, was part of the reason so many engage in illegal mining. Additionally, the DCE state that some are reluctant to register due to the knowledge that they will be monitored by the EPA to ensure that they follow good environmental practice. This entails among others, the requirement of covering up the pits, which has an undesired high cost for the miners. This combines with the fact that the small-scale miners are not able to decide for themselves the area for mining, thus they often believe that gold is found just outside their designated area, which for many might serve as a reason not to wait for the processing of their mining license, as they would have to breach it and mine outside the area illegally anyways (DCE, Manso Nkwanta, 17.01.2014).

5.2.3 Governmental Mitigation of Mercury Pollution and Environmental Impact

Since findings show that the Chinese influx have increased general *galamsey* activity, looking at how the government have treated mercury pollution becomes central.

As described, the mercury pollution emanating from the small-scale mining sector is officially considered a priority environmental concern by the government. However, there are several governmental challenges with regards to improving the situation. A main policy weakness that can be said to diminish the degree of safe mercury use and the sustainability of the whole sector is the lack of specific policy formulations regarding how the substance should be used. It is only mentioned that good practices is to be followed, not defining what it entails (Mercury Act, 1989). This pairs with a tendency where officers from the Minerals Commission has been specifically told not to interact with *galamsey*, but rather stick to military sweeps and "flush" them out. Mercury awareness programs and initiatives have been conducted since the beginning of the 1990s by organizations such as GTZ, the World Bank, as well as UNIDO and the EU. However, similar to more recent initiatives, these have not targeted *galamsey*, but rather just registered miners. Some more recent initiatives have transmitted information regarding these issues over local radio stations, which have increased the awareness to some extent, though also mostly for registered miners (Hilson et al., 2006, p. 4-5). Hence, what is clear is that the government to a very limited extent consults the unregistered miners, thus failing to facilitate better mercury practices among the majority of miners (since 85% are illegal).

Another mercury-specific mitigation initiative was the widespread promotion of the so-called ThermEx of which the Ghanaian government bought 3000 units for USD$ 1 million. The small device is simply a glass metal container in which the amalgam can be burnt, leading the toxic fumes to a small, secluded chamber to avoid its release. However, the device proved to be rather inefficient due to its size, as well as breaking easily, thus being rather unpopular among users. Despite the device's problems, the government kept on portraying it as the ideal solution to the problem, potentially reducing the miners' future susceptibility to receive advice from the government. The resource and money spent could alternatively have been used for education and awareness-rising instead (Hilson et al., 2006, p.280, 281).

These findings with regards to mercury and government's handling of the issue, further combines with the fact that Ghana has not yet signed the Minamata Convention on mercury. This could compromise any initiative to halt emissions and impacts of mercury pollution in Ghana, as will be discussed in the analysis section.

With regards the degradation seen from the *galamsey*, and the Chinese in specific, the local government in Amansie West have adopted their own measures to some extent, deviating from the policies. Initially, when the police confront *galamsey* working in the field, the policy in operation tells them to issue a fine of GHS 5000. This fine is supposed to cover the reclamation of the land, so that it can be used in the future for farming and useful purposes (DCE, Manso Nkwanta, 17.01.2013). However, the government does not seem to be covering pits in the area:

"Somehow. To me, they should have allowed the Chinese to cover the pits, before this problem came, they were not allowed to cover them, and there is so many pits. The government itself does not cover the pits." (District Police Director, Manso Nkwanta, 17.01.2014).

However, this practice has very recently been changed when the new DCE of Amansie West came into office around September 2013. He realized that such a fine is neither effective nor sufficient for reclaiming the large areas of land that has been degraded. Thus, presently, the DCE does not practice this policy, but rather requires all confronted *galamsey* to cover the land themselves before the machines are confiscated (DCE, Manso Nkwanta, 17.01.2013). It

is also mentioned by the DCE that they at some occasions have sent farmers, who sold their land, to the Chinese to court.

5.2.4 Awareness of Policies

One indicator of to what length the government has informed the people on the issue of illegal mining, is to what extent the *galamsey* and community members are aware of the definition of an illegal miner. When interviewees were asked this, most people expressed an incorrect view about what defines an illegal miner. Some *galamsey* even considered themselves as legal operators, while others believed that all people looking for gold are *galamsey*. Still, five out of twelve respondents (excluding officials and professionals) were aware that what make the mining illegal are the lack of registration, and/or the use of heavy machinery. Sentiments from an EPA officer also show that the general knowledge of mining policies and the process of doing mining legally are very limited:

"You know that, to me, experience from the ground will tell me that most of the miners are prepared to register in the institutions. But sometimes ignorance is the cause; most of them do not know that there is a Minerals Commissions, Assembly and the EPA. So we have to step up the education on that front. (...) They are willing! Because most of them, I said, they don't want to go into the industry and only to be sacked by a task force or something." (EPA Officer, Kumasi, 31.01.2014).

Some statements from a Ghanaian *galamsey* support this*:*

"R: Yes, I see myself as a galamsey. Because we are doing gold work. Everybody who looks for gold, we call a galamsey. (...)
I: If all those who look for gold, are galamsey, why do the police arrest some, but not others?
R: Maybe the buyers of those miners don't have a paper, and thus the police arrests the miners.
I: If we were policemen and came to this site, would you run or stay here?
R: No, we will get the buyer to show them the papers. If he don't have the paper, they will arrest him, not us."
(*Galamsey* 1, Manso Nkwanta, 15.01.2014).

This statement indicates that the miner is unaware of any requirements to be registered. Rather, the miner portrays the buyer of the gold to be the one responsible for being a licenced buyer, and that this is the reason that some miners are arrested, not due to the *galamsey's* own actions. However, a respondent working at a Chinese site, expressed a higher degree of awareness, expressing that he had heard expressions from the government that people should register, so that the land will be filled again (*Galamsey* Chinese site, 17.01.2014).

Another related issue is the possible unawareness from the Chinese side, of what is allowed and not in Ghana. As one Chinese expressed in a news report; *"There's no official Chinese agency helping us to understand Ghana's laws, folk customs and industrial sectors."* (Huifeng, 2013b). The same source stated that many of the Chinese *galamsey* are villagers speaking no English, coming to Ghana assuming it is legal since locals are welcoming them into doing it: *"'Many of us are villagers who know no English, who end up coming here and assume it's legal for them to mine on their own. Many local mine owners look for Chinese with money, show us a mining licence, and say 'come and do business'."* (Heuifeng, 2013b).

This also underlines that local miners have a central role in the Chinese's ability to settle and infiltrate the lands with their operations, as they first and foremost see the economic gain, rather than the mentioned negative consequences.

Lastly, ensuring high level of awareness of the mining's environmental- and health effects should be a central task for the government. Not only due to the nature of the impacts themselves, but simply because conducting mining with concern for health and environment is stated in the government's own mining policies (Mining Act, 2006). However, according to both Chiefs interviewed, it was stated that the government have not informed the villages' miners of the health effects from mining (Chief 1, Manso Kwabenaso, 15.01.2014; Chief 2, Manso Koninase, 15.01.2014).

5.2.5 Governmental Rural Assistance and Alternative Livelihoods for the G*alamsey*

As the impact from the Chinese miners has been found to entail an increase of locals going into *galamsey*, to what extent the government has tried to diversify the rural economies is a central issue.

There are not any direct known cases of initiatives taken by the government to create employment alternatives to *galamsey* and farming in Amansie West. However, some actions have been taken in other areas. Some of these have been to facilitate ponds where fishing of *tilapia* was under focus, but this was done without conducting any market assessment to determine its economic potential, and thus failed (Hilson & Banchirigha, 2009). In addition to this, one major obstacle for these kinds of alternative livelihood initiatives to take place successfully is that several prominent people in the governmental system actually claim that *galamsey* is not poverty driven. There is even an example where officers of the minerals commission have implemented an oil palm project where they are practically asking community members to leave *galamsey* only to make around USD$ 236 a year (Hilson & Banchirigha, 2009, p.186). This can be postulated as naive, and a waste of resources as empirical findings show that the *galamsey* earn around USD$ 7200 a year mining for gold. This is also manifested in a quote from a local illegal miner:
"For now, if someone asks us to work in a farm, we won't go, we will stay and work here." (*Galamsey* 3, Manso Nwkanta, 15.01.2014).

However, it is clear that it is starting to be realized that other solutions needs to be put forth for those lacking the interest in the mentioned alternative livelihood options. In 2008, small-scale mining was included in what was termed the National Youth Employment Programme (NYEP), which is under the Ministry of Manpower, Youth and Employment in Ghana. The program already constituted ten different modules, such as urban agriculture, community protection, farming and national volunteers, all intended as sound solutions to the high youth unemployment. The then newly included module, was termed "Youth in Mines", and was to enable the *galamsey* to be recognized by the Minerals Commission, as well as receiving a 6 months training of proper reclamation, succeeded by registration and the provision of machines to enable them to start as legal more environmental sound miners (Tschakert, 2008, p. 25). Some of the programme's achievements have been notable, and is said to have contributed to some of the 200 000 new jobs in 2006, which was 75 000 more jobs created than in 2005, before the programme's existence. Between its start and 2012, as much as 457 779 young Ghanaians have been users of the initiative (Youth Employment Inventory, n.d.). However, in spite of its relative success the government decided to close down the whole programme in 2013, leaving 400 000 workers unemployed. Why this was done, is unclear, but corruption and the department having been involved in the siphoning of money, have been mentioned (Odoi-Larbi, 2013).

The NYEP does not seem to have been offered to communities in this study, as findings show something of the contrary; very low level of governmental contribution and involvement to these remote area's development, infrastructure, and basic needs.

"I: What do you think about small-scale mining?
R: Wait, let me ask you this; is it the president who sent you?
I: No, but the DCE is aware that we are doing these interviews. Why do you ask that?
R: The reason why I'm asking you is no one from the parliament is helping our community. What we are doing here, or everything the community need, we sit down and plan, and take money from each person and do it. We have a committee here who go around and collect money from the community members. We have a bridge here, it's the locals who are doing the galamsey who paid money to build that bridge. The previous DCE had brought some people to collect money from the community members, but we didn't pay, we sacked them. Then we told them that we manage to do things by ourselves here. We are not going to pay them anything. We don't know if the current DCE is going to support our needs."
(Community Member 2, Manso Nkwanta, 16.01.2014)

This also illustrates the government's limited ability to fairly distribute its tax income, where a significant part of it comes from these remote area's mines. Thus, they have established their own form of tax-regime, so to say, in order to fulfil community needs. This interviewee's trust in the government was clearly absent, as he acted very sceptic, and almost aggravated when believing we were officials.

5.2.6 Transparency and Corruption

Findings regarding corruption have been uncovered in data on how the *galamsey* operate. This is therefore not repeated here, but more general findings regarding transparency and corruption from other sources are here presented.

With the mentioned corruption index score of 45 (where 0 is no corruption and 100 is full corruption), it is clear that this becomes a central aspect of the Chinese *galamsey* issue. This is rooted in both the fact that corruption is shown to be a much used tool for the Chinese, but also because high corruption and low transparency in a mineral extracting nation, can

undermine civil society's rights and reduce governmental accountability (Kpessa, 2011, p.37). Looking at the Global Corruption Barometer, based on surveys, one can also get a clear picture of in which public division corruption is perceived to be the worst. In the 2010/2011 barometer, public officials and civil servants received a score of 3.6 out of 5 (five being extremely corrupt), parliament and legislature got a score of 3.7, while the police, being most corrupt, received 4.6. This was paired with as much as 60% stating that corruption had increased between 2007 and 2010, with 37% replying that they had paid a bribe the last year (Transparency International, 2013c). Looking at the more recent 2013 barometer however, as many as 79% of those who had been in contact with the police, had paid them a bribe (Transparency International, 2013d).

With regards to the minerals extraction sector however, in spite of having a rather high corruption score, Ghana has since 19 October 2009 been a compliant of the EITI (EITI, 2014b). Thus, the different parties in mineral extraction; the government and the companies, are now publishing independently what the companies pay to the government as well as what the government receives from the extractive industry. This constitutes an EITI report that is further communicated to the general public, to raise awareness and spark debates about the spending of the revenues (EITI, 2014a). This could be a step in reducing the corruption at higher levels, as well as increasing government accountability, which will be discussed under section 6.2.5.

5.2.7 Task Force

When the Chinese *galamsey* first entered the Amansie West district in 2009, and escalating in intensity towards mid-2013, actions taken towards them were limited or had a minimal effect. These actions were, amongst others, information and public discussions of the issue through radio stations. These were led by the EPA, and did not have a real effect on the situation. The interviewee representing the EPA then realized, through conversations with local *galamsey*, that the only way the Chinese would leave was with a presidential intervention (EPA Officer, Kumasi, 31.01.2014). These sentiments were broadcasted on several radio stations, including three stations in Kumasi. This proved more effective, as the government did follow the advice, and in August 2013 formed a task force consisting of police, soldiers and some allied forces. The EPA's role was to lead the task force to the right areas. By taking their implements and excavators as well as arresting 169 in the Ashanti region, leading to

deportation for some, the amount of Chinese *galamsey* significantly declined between August and December 2013 (EPA Officer, Kumasi, 31.01.2013; Kane, 2013). The national number of deported Chinese is said to be around 4500 the same year (Hirsh, 2013). In addition to this, the amount of locals coming in to register as miners did actually increase just after the establishment of the task force:

"Because after the task force, after their work, we saw an upside of people come to the office to register. It's just, you cannot believe it. Because they are prepared to register and get their permit." (EPA Officer, Manso Nkwanta, 31.01.2013).

Through a reply from a Chief, regarding how many Chinese are in the community, it also seems it had some impact in the area:

"There were, let's say, three groups here, but because something happened over there, so the government told the Chinese to leave the place. At this time, there are no Chinese miners in this community, they just come here and leave, they don't stay here and they don't work here" (Chief 1, Manso Kwabenaso, 15.01.2014).

However, these actions did not prove to be sustainable, and the Chinese are now increasing in quantity again, many of which are the same that was deported (EPA Officer, Kumasi, 31.01.2013). This is confirmed by a news article dated as recent as May 5th 2014, communicating sentiments by Robert Nyankah, the chairman of the National Security Committee on Lands and Natural Resources (NSCLNR). This is argued to be a result of the task force operations having stopped for some time, due to political reasons further described in 6.2.11 (Today, 2014). Although, many are back, it was expressed that the Chinese now act much more cautiously, and some are claimed to cover up the places they have mined. Others even try to comply with the EPA's condition of keeping 100 meters away from river bodies (EPA Officer, Kumasi, 31.01.2013).

Lastly, according to the Executive Director of Wassa Association of Communities Affected by Mining (WACAM), the task force is now often only targeting locals. The Chinese are said to be allowed to continue, as they are portrayed by the task force as only providing technical support to small-scale miners (Essel, 2014).

5.2.8 Border Control in Ghana

As many Chinese *galamsey* are said to enter neighbouring countries with tourism visas before illegally entering Ghana across the borders, the control of these is a crucial aspect of being able to cope with the issue (Kane, 2013). Currently, the border controls of Ghana cannot be described as adequate, and has several caveats such as the insufficient screening and monitoring of foreigners (Sosuh, 2011).

The countries bordering Ghana, of which the Chinese are able to enter through, are Côte d'Ivoire along the 668 km long west border, Togo at the 877 km east border, and Burkina Faso at the 546 km north border (Nation Master, 2014). The agencies directly administering these borders are the Customs Excise and Preventive Service (CEPS), the Ghana Immigration Service, and the Police Service. In addition, the Ministry of Foreign Affairs (MFA) also have a role, as they are the ones authorizing visas, as well as determining which of the Chinese *galamsey* are deported when arrested (Sosuh, 2011). Specific issues regarding border control under these agencies' jurisdiction are logistic problems and a general lack of resources, both human and technologically. This is combined with a special concession given to hawkers (people selling goods in trafficked streets) along the border, which allows them to cross without showing their identity. Further, these individuals are often helping people in finding appropriate routs to cross the borders illegally (Sosuh, 2011, p.26), potentially also the Chinese *galamsey.* This situation further pairs with a widespread culture of corruption in the relevant institutions. In-fact, abiding from the norm of corruption is actually said to be met with no support, and instead, potential being a reason for losing one's job. Furthermore, the cooperation between these mentioned agencies, both domestically, but also cross-border, is very limited, and does not realize the potential of more effective border control (Sosuh, 2011, p. 28-29).

According to Jiao Yang, a researcher at the University of Florida, the current procedure to officially retrieve a visa to Ghana for the Chinese, is very difficult. According to him, the way they are able to get them, is generally through corruption:

"'Since 2010, it has become nearly impossible for a Chinese worker to obtain a Ghanaian visa in Beijing. Their visas were handled by agents who have connections with some

Ghanaian immigration officers or the Ghanaian embassy in China. Agents give bribes to these immigration officers in return for mass visas. Some agents give visas to Chinese miners on arrival at the Accra Airport Immigration counters. For most of the miners, their visas would only get renewed when they are leaving Ghana at the end of their contracts. This again is handled by agents and Airport Immigration officers. Therefore, Chinese miners are only legal when entering and leaving Ghana, but illegal when they are working at the mining sites.'" (Li, 2013).

5.2.9 Government Capacity

Compared to other Sub-Saharan countries, Ghana has a relatively good governmental capacity. In the World Bank's governance indicators, it is seen that Ghana is better off than its Sub-Saharan peers in all aspects. Indicators comprise political stability/absence of violence, regulatory quality, and rule of law, as well as government effectiveness and control of corruption. The two latter indicators however, have been declining between 2007 and 2012 (World Bank, 2013).

From having examined Ghana's EITI report for 2010-2011, the distribution of the government's income from the mining sector is presented in table 6.

Table 6: Distribution of government's income from the mining sector

Beneficiary		Share (%) of Total Amount.
Government in Consolidated Fund		**80%**
Minerals Development fund		**10%**
Office of the Administrator of Stool Lands	10% Of Total Amount	
• The Administrator of stool Lands takes 10% of the amount received to cover administrative expenses. The remaining 90% is distributed as follows.		1%
• **District Assemblies**	55%	**4.95%**
• **Stools**	25%	**2.25%**
• **Traditional Councils**	20%	**1.80%**
TOTAL		100%

(Ministry of Finance and Economic Planning, 2013, p.18)

As can be seen, a very small portion of the revenues is distributed to other bodies, of which many are responsible for enforcing the mining policies. This is paired with a situation where the districts and areas where most of the mining income comes from, receives very little of it, constituting an unbalanced relationship between stakes and gains. The District Assemblies only receives a 4.95% cut from the total amount. This is further manifested in a state where there are significant technical knowledge constraints, as organizations and companies offering better conditions recruit the competent workforce (Carson et al., 2006). It can also be seen that still, only 10% of the royalty income is spent on what is called the Minerals Development Fund. However, the distributions of these are seen to be poorly done, with very little of it having potential to benefit the grass root, as will be discussed in section 6.2.10. Lastly, it is seen that the EPA, which is responsible for managing physical impacts rooted in mining, receives nothing from this cut (Roe & Jonathan, 2007, p.78). This partly explains the EPA's limited capacity, as will now be turned to.

According to Revenue Watch Institute, Ghana's legal framework of EIA has a score of 50 out of 100 (2013). Thus, in this matter, polices are in place, though perhaps not adequate. One example of such EIA is the described requirement of mining concession applicants to deliver an impact assessments as well as reclamation plan to the EPA, which then announces a potential mining site for 21 days (EPA Officer, Kumasi, 30.01.2014). However, in the 2013 Resource Governance Index, they received a score of 0 out of 100 regarding the implementation of EIA (Revenue Watch Institute, 2013).

An even more important aspect of the government's capacity with regards to dealing with the *galamsey* can be seen in to what extent they have been able to establish functioning Small-scale Mining District Offices. These are offices created and managed by the Minerals Commission, and are intended to provide education and awareness among small-scale miners, both legal and illegal. The District Offices are also intended to conduct general monitoring and development of the small-scale mining sector and promote registration. However, Ghana having ten regions, with a total of 206 districts, only seven districts in seven different regions have such an office, where none are found in Ashanti (UN, n.d.b).

5.2.10 The Chinese Government's Actions

As an informant through a secondary source stated, there has been no aid available from the Chinese government with regards to how the Chinese miners are to operate and manage in Ghana. Rather the sentiments expressed from the Chinese government's side are that they should leave their investments and equipment behind and go back to China. Politically, this can be argued to be the only sound thing to do, as small-scale mining is illegal for Chinese in Ghana. However, the informant does express an important point; that they are most willing to contribute with the development of the communities they are working in, which seen from the Chinese miner's stand point, would be a better situation for both parties. The example also illustrates the miner's absence of awareness regarding Ghanaian laws:

"'If the Chinese government offered us more help to communicate with Ghanaians in economic and social fields, we wouldn't face the current tensions and violent conflicts with locals. We would like to build schools, churches and hospitals in local communities. We would like to teach local people our skills… In return, we could have long-term and peaceful co-operation in Ghana's mining sector. (…) But so far it's hopeless, because the Chinese embassy in Ghana and officials from our hometown only try to persuade us to leave Ghana, leaving our equipment and investments. Why can't they help find a win-win way out? And what's the rise of China worth for Chinese individuals?'" (Huifeng, 2013b).

Further, a news source states that in Shanglin, where most of the miners originate, the local government issued a warning against mining in Ghana, and also allegedly offered to pay for the miners' return tickets (Bloomberg News, 2013). In addition, it has been stated by the Chinese ambassador in Ghana, Mr Gong Jianzhong, that the situation will not affect the

relationship between the two countries, while also encouraging the Ghanaian government to be strict in their law enforcement to ensure the elimination of *galamsey*. Further, by the Deputy Director of the Chinese Foreign Affairs Ministry, it was claimed that the government have encouraged Chinese abroad to abide to local laws, while they also were putting in place measures to check illegal immigration from China to other countries (Government of Ghana, 2013a). However, in spite of all these statements originating from June 2013, the situation is yet not solved.

Lastly, recent news reports are stating that, in addition to tightening visa procedures for Ghanaians going to China, they have failed to grant a loan of USD$ 3 billion, which was agreed upon prior to the deportations done by Ghana (Hirsh, 2013). The loan was meant to finance infrastructural developments, entailing eastern corridor road networks. According to Robert Nyankah, Chairman of the NSCLNR, this is a main reason to why the task force operations have come to a halt (Today, 2014).

Chapter 6: Analysis of Findings

In this chapter, the presented findings will be analysed in a manner following the order similar to their presentation, first dealing with those related to research question one (R1), then discussing findings in relation to research question 2 (R2).

6.1 R1 – The Impacts of the Chinese G*alamsey*

This section discusses the impacts of the Chinese *galamsey* and their implications. The order follows that of their presentation; environmental impacts, social impacts, and socio-economic effects. Lastly, section 6.1.4 aims at visually summarizing the impacts and their relation.

6.1.1 Environmental Impacts

The most significant environmental impact seen from the Chinese *galamsey*, is the increased land degradation. Before the influx of the Chinese, local *galamsey* operators also contributed with similar issues, not covering the land, and creating holes in the ground, which in the worst cases could cause people to fall into them and die. What the findings show however, is that the Chinese have mechanized the *galamsey* sector in the district, as machines such as excavators and bulldozers were not used by locals initially. Now, the common practice is, for non-Chinese-operated *galamsey* sites as well, to hire excavators to dig out larger pits enabling more effective gold mining. Thus, the land degradation is not only increased by the Chinese miners, but also as an indirect effect through the general change in practice by all *galamsey*.

Considering the vast land degradation described in section 5.1.5, combined with the mentioned impacts this can have for ecosystems, food security and even climate, it can be argued that the small-scale mining situation in Ghana is highly unfavourable (UNEP, n.d.; Asiedu, 2013; IPCC, 2007). The implications of having the amount of illegal Chinese miners in forests and former farmland can thus be severe in the long run.

As some respondents reported, the government's responsibility of covering the land after having claimed the fine from the *galamsey* operators was seldom fulfilled. This is most likely rooted in the fact that the cost of the reclamation is much more than the GHS 5000 fine the operators has to pay. Thus, in the case of Manso Nkwanta, the DCE, now demands that the *galamsey* that are caught cover the land themselves before their machines are confiscated. This is not only more economically sound, but also more efficient, as one do not have to use

as much governmental work force in the process, releasing it for other purposes than land reclamation.

As the picture data in section 5.1.5 shows, there are still vast areas abandoned by *galamsey* that needs recovering or treatment to be able to serve as future forest-cover or farmland. It is also central to note that simply covering the land areas after they have been mined is not sufficient for reverting it to farmland. In-fact, achieving this requires as much as 5-10 years of continuous attention to the area that is being reclaimed, and is a process rather than an action (Asiedu, 2013). In addition to this, *assisted restoration* requires expertise and knowledge, and should be done in the mentioned specific manner, which according to Asiedu can cost a little less than GHS 101 000 per acre. In 2006, 12% of the national total 238 533 square km areal of land, was under mining concessions (Schueler et al. 2011, p.531). Thus it becomes possible to calculate the estimated land reclamation cost if one hypothetically were to treat all areas struck by mining through the *assisted restoration*. In addition to being an old number, it excludes *galamsey,* and will thus give a modest, rather than excessive result. However, this is of course not pragmatic, and the country would then loose its main export. However, for illustrating purposes, the calculation can be done. With rounded reclamation costs being GHS 100 000 per acre, and 1 km^2 equalling around 247 acres, the costs per km^2 are GHS 24.7 million. The total cost is thus around GHS 766 billion[15]. This equals USD$260.2 billion[16], or 56.5 years of Ghana's gold production output using the 2011 numbers as a basis[17]. With the slightly out-dated, and as discussed; modest, 2009 estimation that minimum 15 000 hectares are degraded from small-scale mining exclusively (Owosu-Sekyere, 2009), one can also calculate the potential cost of reclaiming these areas. Thus, the potential cost of reclaiming only land struck by *galamsey* to farmland, would costs at least GHS 3.64 billion, or USD$ 1.23 billion[16]. Although, this amount is probably significantly more now as the activity has increased.

Another figure that can be vaguely calculated is the estimated reclamation cost of Amansie West's total area of lost farmland (which this cost frame is intended for) rooted in the Chinese *galamsey*. Official sources state that, including horticultural crops, fruit trees, oil palm and

[15] 13% of 238 533 km^2 = 31 009 km^2. 31 009 x GHS 24,7 million = GHS 765,922,300,000
[16] Using XE Currency Converter's rate of GHS 1 = USD 0.339848: Retrieved (25.05.2014): http://www.xe.com/currencyconverter/convert/?Amount=1&From=GHS&To=USD
[17] Using World Gold Council's number of USD$ 4.59 billion (2013), and dividing USD$ 260.2 billion on that number.

citronella, the areas cultivated in the district were at least 2194 acres (again being a modest minimum estimate) (Amansie West District Assembly, 2006). As can be noted, the source is dated initial to the Chinese influx. This equals around 8.88 square km[18]. Further, the DCE estimates that around 30-50 % of the farmland has been lost due to the Chinese miners, which constitute 2.6 to 4.4 square km[19]. Thus, using the same cost frame as above, the reclamation cost would be between GHS 64 million and 108 million to revert the land to farmland.

A more interesting number that can be generated is how much it costs to reclaim one average piece of farmland that is sold to the Chinese. Official data shows that the average farmland size in the Amansie West District is 12.8 acres (Ministry of Food and Agriculture, 2013). Using the same cost frame again, this shows that the cost of restoring the mined land to fertile farmland, will be GHS 1.28 million[20], or just below USD$ 435 000[21], over a period of 5-10 years, which equals no less than GHS 256 000 a year[22]. Below is an overview of all estimated potential reclamation costs.

Table 7: Estimated *assisted restoration*- costs of degraded land

Total potential cost of land reclamation of all mined land in Ghana			
Total land under mining concession (km^2)	Cost per acre	Cost per Km^2	Total cost
31 009 Km^2	GHS 100 000	24.7 million GHS	**GHS 765.92 billion**
Total potential cost of land reclamation of all degraded land caused by *galamsey*			
Degraded land from *galamsey* (hectares)	Km^2	Cost per Km^2	Total cost
15 000 Hectares	150 Km^2	24.7 million GHS	**GHS 3.64 billion**
Potential cost for assisted land reclamation of farmland in Amansie West estimated to be degraded from Chinese *galamsey* activity			
Farmland in Amansie West estimated to be degraded by Chinese (km^2)	Cost per Km^2	Total cost	
2.6-4.4 km2	24.7 million GHS	**GHS 64-108 million**	
Potential cost of reclaiming an average-sized farmland sold to the Chinese			
Average farmland size in Amansie West (acres)	Cost per acre	Total cost	
12.8 acres	GHS 100 000	**GHS 1.28 million**	

(Source: Author)

[18] 2194 acres/247= 8.88 km^2
[19] 8.88x0.3= 2.6 km^2. 8.88x0.5=4.4 km^2.
[20] GHS 100 000 x 12.5 acres = GHS 1.25 million
[21] Using XE Currency Converter's rate of GHS 1 = USD 0.339848. Retrieved (25.05.2014): http://www.xe.com/currencyconverter/convert/?Amount=1&From=GHS&To=USD
[22] GHS 1.28 million divided by 5 years

Hence, contrary to forest-covered land which only requires the *natural restoration* method to return to its original state, mined farmland is not only time-consuming, but very costly to revert to its original state, as *assisted restoration* needs to be applied. Therefore, limiting the amount of farmland that is used for mining is crucial for the communities' development and future, as the income of gold is not sustainable in a given area, and is bound to drop. When the time comes where gold output is minimal and all farmland is destroyed, the whole area could be deemed degraded and inhabitable due to the inability, or lack of political will, to pay for recovery. Hence, the impact from removing top soil and forest-cover have shown to have significant long-term consequences, in addition to contributing to increased CO_2 emissions, which partly contributes to wider long term percussions through altering the climate (World Meteorological Organization, 2006, p. 10; Barker et al., 2007, p.67; IPCC, 2007).
On top of these direct costs of restoration, the economic multi market model (EMM) postulates that the current rate of soil loss in Ghana, where the Chinese *galamsey* now play a significant role, can lead to an agricultural GDP in 2015 which would be USD$ 860 million, or GHS 2.57 billion[23], lower than without the soil loss. Using the 2011 agricultural GDP as a basis, that was at GHS 14.1 billion (Ghana Statistical Service, 2012, p.4), this implies that the GDP in 2015 could have been around 18.2% higher without the current soil loss[24]. Hence, this would also impact the poverty rate, which is projected to potentially having been 5.7% lower than with the current soil loss (Sarpong & Dao, 2007). Additionally, as the farming sector employs around half of Ghana's work force, such a decline will have a significant grass-root impact (African Development Bank Group, 2012, p.8). Although, the EMM is based on soil loss rooted in all relevant activities, including farming, general deforestation, as well as industrial activities and urbanization, not only mining. However, the model does serve to illustrate that there is a negative connection between GDP and poverty rate, and land degradation in Ghana. With the presence of Chinese *galamsey*, and their adopted harmful practices, it can be argued that they contribute to this to some extent.

The release of mercury into the eco-system is another environmental impact, which has been indicated to be increased from the Chinese influx. However, since the study has not had the resources to do measurements of the water quality and mercury content of it, and being unable

[23] Using XE Currency Converter's rate of USD$ 1 = GHS 0.299699. Retrieved (28.05.2014): http://www.xe.com/currencyconverter/convert/?Amount=1&From=USD&To=GHS
[24] Agr. GDP + potential GDP change = 14 155 000 000 + 2 577 412 818 = 16 732 412 818
= (16 732 412 818 - 14 155 000 000) / 14 155 000 000 = 0,182 x 100 = 18.2 %.

to retrieve trends of these measurements, illustrating the Chinese degree of such impacts is difficult. However, what has been retrieved is data from the EPA staff, says that mercury content in the water in Amansie West is limited, and that many do not use mercury as actively at site as the researcher believed. Since other sources both first-hand and second-hand show the contrary however, it might implicate three things. Either that simply measuring the content of mercury in the water is not sufficient for determining its content in the wider eco-system, that it has not been done in the right manner, or that the mercury concentrations are too low. Either way, what can be drawn from this, is that the EPA officer's statements is not right, since the researcher visited a *galamsey*-field that did use mercury at site.

Additionally, another conclusion can be drawn from the above paragraph. As the EPA informant allegedly is the agency's officer who had the longest experience working in the Amansie West district, and still plausibly being wrong in his statements, can indicate a low level of interaction between the EPA and unregistered miners. Thus, this shows that participation and engagement with illegal miners might not have been as high as it should be, knowing that most small-scale miners in-fact are illegal, or *galamsey*. Further, by looking at official health data it has been uncovered that respiratory trait infections has climbed in correlation with the Chinese influx, thus potentially indicating that mercury is used. Hence, combining all findings, it seems plausible that the Chinese have contributed to an increase in mercury emissions into the environment, if not at site, then at most likely through airborne releases. Thus, according to various literature this can undermine the ecosystem- and human health (Veiga et al., 2006; Tschakert & Singha, 2007; WHO, 2007).

In addition to mercury having contributed to pollute water bodies, it is also found that the use of excavators has destroyed several rivers through diversion of them or increasing their sediment content, making them unsuitable for farming and other applications. It can be argued that this also contributes to making farming even harder, and as a source stated, the farmers now use water from small plastic bags in the farming instead of that from the natural streams. Thus, farming is now more labour intensive, which could contribute to further increasing a shift to mining. On top of this, a 20-40% decline in rainfall between the 1960s and 1990s, in combination with a clear perceived dryer climate in the Ashanti region (see table 3), might further contribute to this shift (Boko et al., 2007; Müller-Kuckelberg, 2012)

6.1.2 Social Impacts

Many of the direct and indirect impacts rooted in the Chinese *galamsey's* presence can be defined as social in nature, and are discussed here.

One of the most frequently mentioned social effects by respondents, were that the influx of Chinese illegal miners have contributed to an increasing amount of youth venturing into the *galamsey* sector. This is sometimes done in combination with school, reducing the schooling's effect due to absence and lack of doing homework, but more often as a substitute to school. Thus, it is clear that the situation is directly contributing to reduced high school education level that could have led to a higher return for the individual and the society in the long run. In other terms, there is a reduction in one of the aspects of human capital (education), which in this case also leads to a reduction in the other aspect of human capital; health. This is rooted in the fact that the shift from schooling to mining entails certain mentioned health risks (WHO, 2007).

In addition to the mere long-term effect of not pursuing education, there is also seen a tendency that youth are getting an increasing autonomy due to generating income much higher than their parents, of whom many work as farmers. This autonomy which comes from the shift from farming and/or schooling to mining can also be postulated to leading to a trend where the young generation are increasingly unable to do effective farming, as they do not take part in their family's farms, learning the profession. Thus, without schooling or farming abilities, they have a very limited choice of what to do when the gold reserves in the area are getting scarce. Hence, moving to Kumasi to beg for money, or moving away seeking for other gold deposits, seems like the most likely alternatives. Ironically, this is very similar to what has been uncovered to be the case with the Chinese *galamsey* in Ghana.

Alteration of the communities' human capital, or education and health, are found to be the most central social impacts the Chinese *galamsey* can be said to have. Findings show that between 2008 and 2009, respiratory trait infections increased with as much as 59 per cent. Although, this is only a "snapshot" view of the trend, it shows that the correlation between the increase of such infections highly coincide with the increased influx of Chinese miners. The same goes for the increase in HIV cases, which according to various sources, can be estimated to have increased with 134 per cent from 2009 to 2012, which is the period where Chinese *galamsey* most intensely increased. This is also the case with malaria, a decease that is seen as drastically increasing when *galamsey* pits are around; serving as breeding grounds for

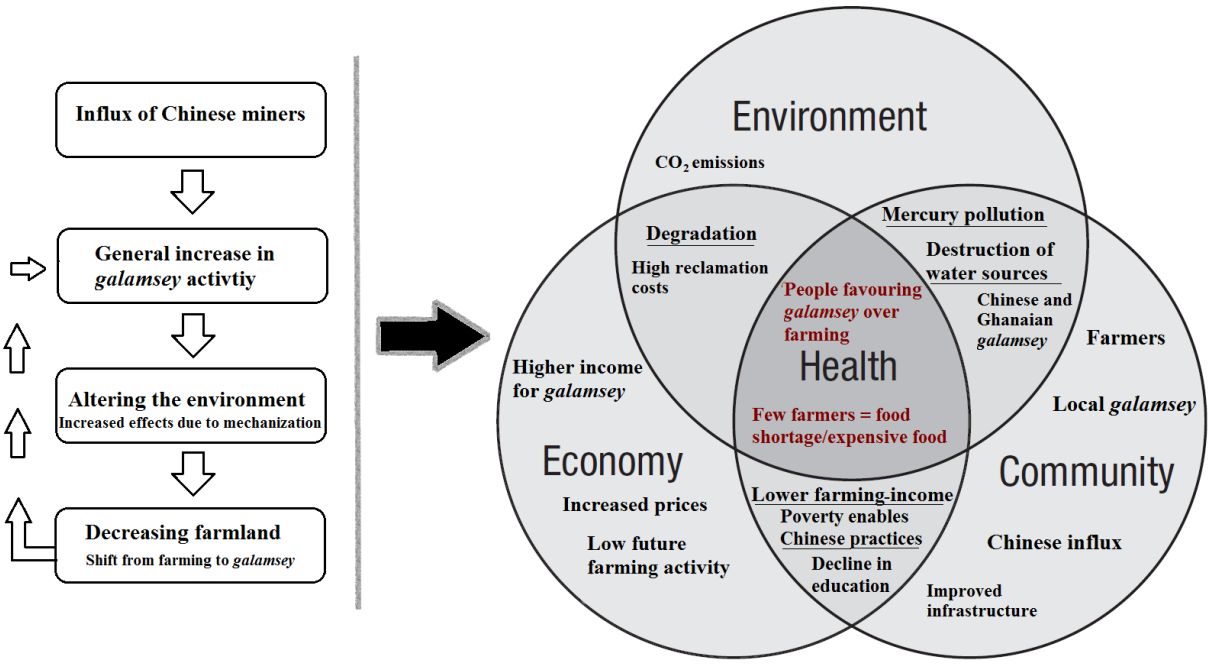
mosquitos. Similar to the available data on respiratory trait infections, the location specific data here available is limited to the years of 2008 and 2009. The occurrence in the latter year was 23.4 per cent higher than that of 2008, and thus also correlated with the Chinese-driven increase of *galamsey* activity. Thus, from these three different indicators associated with *galamsey* activities (Carson et. al, 2005; Veiga et al., 2006; WHO, 2007), all correlate with the increase of Chinese miners. If these findings are seen isolated they do not necessarily imply a causal relationship. However, since all these are symptoms strongly associated with *galamsey* activities, this causal link can seem more likely. When these health effects pairs with the decline in education, one gets the mentioned reduction of human capital. Hence, in line with Todaro & Smith, the communities' already low potential for growth and development is to a certain extent undermined from these effects (2011).

It was also found that many women in mining communities become single mothers; in some cases due to Chinese impregnating them before they later on leave. Single mothers are naturally much more prone to reproduce poverty, as it becomes harder to afford a proper education for the child. This is attributed both to the sheer lack of money to pay school fees and equipment, as well as the high short-term alternative cost it is for the household to send the child to school instead of having it work. Similar effects can be assumed from the found increase in child/youth pregnancy, which not only is said to increase prevalence of single mothers, but also involve premature birth, poverty and generally lower income, as well as decreased cognitive abilities for the child (Gueorguieve et al., 2001).

Using Lebel's *ecosystem health- approach* can help shed light upon how the three aspects of community, environment, and the economy intertwine, and constitute health, in the case of Manso Nkwanta, and surrounding areas. It has become clear that there is a situation where the characteristic of the community and economy (increasingly consisting of mining), affects the environment while also affecting each other, in line with Lebel's theory (2003, p.7). This is portrayed in figure 16, which is based on Lebel's model. On the left-hand side it is illustrated how increased *galamsey* activity can be further reinforced in communities where farming is the only real alternative. Looking at the circles, based on Lebel's model, one can see that change in the community due to the Chinese influx changes the environment through degradation. Together with the direct effects of the Chinese presence, this changes the economy by increasing prices, and income. This new situation then makes it increasingly desirable to do *galamsey* as the farming sector is being undermined. Additionally, it can be

seen that poverty is a contributor to enabling the Chinese practices, as joining/helping them is economically beneficial. Thus a change in environment, the economy, and the community all serves to alter the health negatively manifested in health-effects that has been discussed. However, increased income and contributions to infrastructure might be argued to be a positive contributor to health. Although, it is not illustrated as such in this figure, due to the model focusing on negative impacts on health in an attempt to clarify relationships. These links are illustrated below in a figure based on Fig. 6.

Figure 16: Findings illustrated based on the *eco-system approach to health* model



(Source: Author)

Hence, in order to adequately deal with the issue, this realization needs to be present, and seeing environment, the economy and the community as intertwined and all affecting the human well-being, where health is a central aspect, is of utmost importance. Based on the data however, this does not seem to have been the view of the government, who have mainly been focused on directly reducing the current amount of Chinese *galamsey* by force, rather than focusing on reducing premises that makes them able to settle with their operations, which so-far is seen to be manifold. Thus, what is seen is that health, education, income/economy and environment are all intertwined as part of the problem and therefore also the potential solution, either by better policies, better implementation of them, or a combination of both, as will be discussed later on, in section 6.2.

An additional social consequence of the presence of Chinese miners is the mentioned fact that the Chinese have become targets for theft and violence, thus having been forced to acquire hand guns in order to protect themselves. The violence that has been occurring in the Siana community was reported to be rooted in local's disapproval of the Chinese activities and thus underlines how the effects impact the local population. These findings can be seen to coincide with Maathai who states minerals' potential role as a root for conflict (2009). Further, the increased presence of weapons such as guns and rifles is something that can contribute to increased social tension, and in some cases open conflict, where lives are lost or people harmed. It can also be assumed that when one party acquires guns, other parties not initially targeting the Chinese, also acquire guns in order to feel safe. Thus, locals who attack Chinese incentivises that group to protect themselves through firearms, which further raises the perceived risk level in the area, contributing to local's doing the same, thus initiating a negative spiral. This social process is backed up by Williams and McGrath's findings stating that victims of crime, and/or those who express fear, are more likely to own guns, which again is attributed to higher violence proneness (1976, p.25). This trend can be said to potentially increase Ghanaians' negative sentiments towards the Chinese, and further worsen the latter's mentioned image problem. This is enforced by the Ghanaian media's tendency to portray the situation as Chinese entering the communities already carrying weapons, making the areas unsafe, while in reality, the armament might often be initiated by locals who execute armed theft.

Lastly, another social impact is rooted in the fact that China is characterized as having widespread corruption, in many ways being a part of the Chinese culture (Yao, 2002). Hence, the country is ranked worse than Ghana with regards to corruption, listed 17 places below (Transparency International, 2013b). When this combines with the uncovered frequent use of bribing by the Chinese, it can be argued that the influx of Chinese miners in Ghana could contribute to increasing the general use of corruption in the areas they operate, as they frequently incentivise corruption from officials and Chiefs for access to areas and land by bribing them.

6.1.3 Socio-Economic Impacts

As indicated in the previous section, a shift from schooling to *galamsey* might serve to reduce an individual's future economic returns. However, applying the widespread findings that education generally gives higher economic returns is here only partly valid (Todaro & Smith, 2011). In the case of Amansie West, the options are limited, and as one respondent mentioned *"there is only farming and galamsey"* (Community Member 2, Manso Nkwanta, 16.01.2014). In other words, the necessary externalities such as a sufficiently diversified economy are not present, at least not in the rural areas. Thus, the attitude that schooling will only give them the possibility of working as a farmer or miner is no good incentive to complete their education; as these are jobs they can have regardless of education. However, in spite of a limited employment possibility, the trend of having a declining portion of the youth finishing high-school education can certainly be argued to undermine the district's future potential for economic growth and development as having educated people are important in increase an economy's diversity.

From the findings it is indicated that locals working at Chinese sites in the Amansie West region, tended to earn a little more than their counterparts working at Ghanaian-run sites. This underlines the important aspect that Ghanaian miners, in general benefit economically from the Chinese presence, rather than being impaired by it as some claim (Kane, 2013). Further, if compared to what the local miners earn at the legal small-scale mining sector, the benefit is even larger, compromising an 80 per cent higher income when working for the Chinese. However, it has also become clear that the Chinese-employed Ghanaians earn significantly less than their Chinese executing the same work, with the latter earning between 100-140 per cent more. In spite of this, none of the local miners working at the Chinese site expressed any dissatisfaction with their employment situation in this regard, only stressing that they are happy to earn well, and much more than they used to do. The figures found on the difference in income from the Chinese-run mines and the Ghanaian-operated mine, further shows that the former is significantly more effective in their operations. Combined with the mentioned sentiments that better technology and more capital has been expressed needs for the local *galamsey* for many years, the influx of the Chinese, who provides just this, can in such a limited sense be seen as an improvement to the lives of many community members.

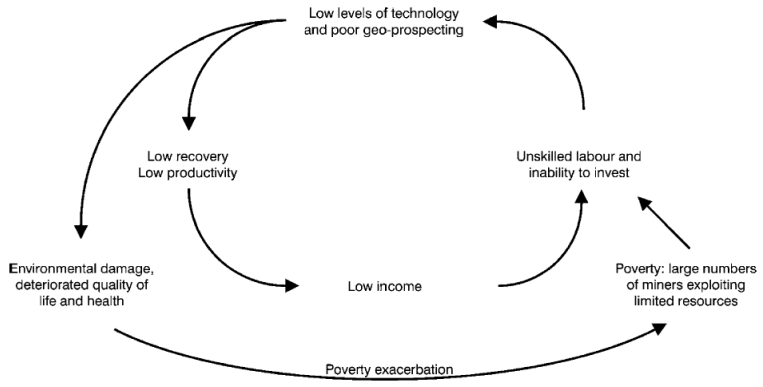
On the other hand, if the economic situation is seen in a longer perspective, it is clear that having Chinese *galamsey* in the community the way they currently operate is not very sustainable. This is evident due to the fact that a lot of the land used by the Chinese is farmland. In an area where 70% of the employed population are engaged in farming, this tendency, combined with the long and costly process of *assisted land restoration*, can prove to have devastating long-term economic effects for the communities. In addition to this, it was found that some of the farmers, who sold their land, spent the GHS 5000 for consumption or building another room, which does not give any future economic returns. Another farmer was reported to have saved the money in a local micro-finance institution, but due to the difficult general economic situation of the district, these institutions are going bankrupt, and thus leaving clients broke. Hence, from these findings, one can draw the conclusion that a core issue of the situation is that local farmers/landowners have a very short-term mentality, which could be rooted in the lack of education, or even more likely, their very low income. With an average annual income of GHS 750 a year, receiving GHS 5000 for their land is very tempting, as it equals around six and a half years of their income.

Another economic effect rooted in the Chinese influx, is the mentioned increase in prices, due to an alteration of both supply and demand (Marshall, 1920). This is of course a two-sided issue, as it can be said to benefit the shop owners, while at the same time give other community members a lower degree of purchase power per monthly income. Findings showed that prices of the most common vegetables have increased between 50 and 150 per cent since the influx of the Chinese. Naturally this can have a devastating impact on many households of which do not have anyone employed in the mining sector. The price increase is said to be rooted in both the increased demand from the influx of Chinese and Ghanaian *galamsey*, but also due to the decrease in supply, which is seen as an effect of farmers selling their land for mining activities. This change in price can also be expected to increase people's interest in joining the Chinese for *galamsey* activities, as they are shown to earn more choosing to do so than not, thus being more likely to handle the price increase. Since the inflated prices are not correlated with the decline in farming income, it can indicate that most of the benefit from the increase reaches the shopkeepers, who due to selling other commodities as well, have more leverage than the farmers; who are fully dependent on getting their produce sold.

The Chinese *galamsey* are further seen to contribute with inputs into some local communities through what can be said to be very reminiscent of many companies' CSR initiatives. This is defined by Amponsha-Tawhia as *"the strategic decision of an organization to voluntary act upon the social factors that have the potential of militating against the fulfilment of corporate goals"* (n.d, p.108). This can be seen as quite unexpected, as they does in-fact operate illegally, making it seem more plausible that they did not care about such matters. In one case, the community received a total of GHS 17 500 from the Chinese for constructing necessary infrastructure, giving them agency to improve their communities themselves. In addition to this, it was also reported that local *galamsey*, having adopted the Chinese mining practices, were spending some of their money for building infrastructure and satisfying the needs of the general community. Thus, many of these investments from *galamsey's* income can be described as rooted in the Chinese influx. From these findings one can also postulate that the Chinese are well aware of their negative impacts on the communities located in the areas they are operating. Had they not been aware of the impact and potential negative reactions from locals, such as the mentioned violent conflicts, it is not very likely that they would have agreed to support the communities to the extent that they have.

Lastly, retrieving back figure 7, one can see the Chinese miners in relation to the poverty trap which *galamsey* is claimed to be (Noetstaller, 1996; Hilson & Pardie, 2006).

Figure 7: *Galamsey* as a poverty trap



(Hilson & Pardie, 2006)

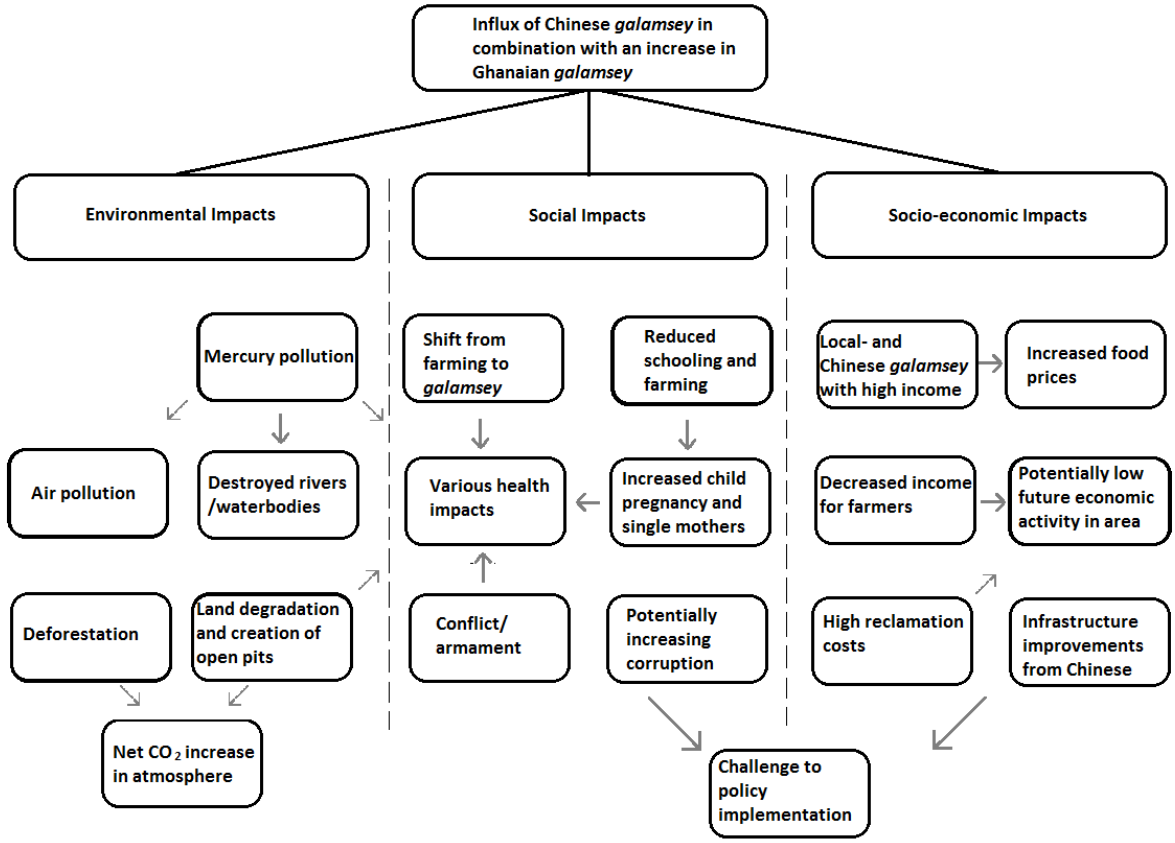
It can be argued that with the Chinese influx, the upper level of the illustration; the level of technology and geo-prospecting, has improved as a result of the influx. Findings show that the Chinese have introduced excavators and knowledge, which have made the operations more

efficient. Going left, as seen, this leads to environmental damage which in this case becomes even more intense, leading to poverty exacerbation for non-miners (as the data shows). This could then lead more people into engaging in mining, thus putting an even higher pressure on the resources. On the other hand, looking at the inner circle, technology improvements lead to high productivity and thus high income instead of low income. It can also be argued that it contribute with raising miners' skills, which combined with their increased income makes them able to invest. This fits with the data, showing that local *galamsey* of which many have applied the Chinese mining method, now invests some of their income in infrastructure and central necessities for their communities. Summing up, one can see that the Chinese influx does impact the so-called poverty trap, where the impact can be termed positive for the inner circle, and negative for the outer circle. Whether the total impact is positive or not, is open for discussion, but it does become clear that the long-term effect at least, might not be positive in character if proper land reclamation and environmental concern is not taken.

6.1.4 Summary of Impacts

As an overview, all central effects from the Chinese *galamsey,* and their relationship, are portrayed in figure 17. The impacts are sorted vertically according to their character, whereas arrows indicate causal relationships that have been postulated as probable. Corruption and the Chinese provision of infrastructure and community needs are also here portrayed as a challenge to implementation, something that will be discussed in the next section, 6.2.

Figure 17: Overview of Indicated Impacts



(Source: Author)

6.2 R2 – Why the State Fails in Solving the Situation

In this section issues regarding research question two will be discussed. Some aspects of the discussion are not dealing specifically with the Chinese *galamsey* but rather the general *galamsey* sector. This is grounded in the fact that the issues have proven to be very intertwined. Furthermore, when it comes to the effects from the Chinese, many of them are of an indirect character, where the influx has increased the general *galamsey* impact.

6.2.1 Registration Procedure and Time Frame

Due to the mentioned link between Chinese influx and increased general *galamsey* activity and efficiency, raising miners' susceptibility to register is central in order to ensure environmental sound practices, including timely land reclamation. As presented in section 5.2.1, the current SM policies call for registration in order to enable legal mining. However, less than 15% of all small-scale miners have done so. Thus, it can imply that the policy and requirements in relation to the registration might be poorly rooted in the reality on the ground.

Prior to the 2006 Mining Act, when the Mineral and Mining Law of 1986 was in force, there existed no time limits for the duration of the application procedure contributing to a situation where prospecting legal miners would have to wait for extensive periods (UN, n.d.b, p.7). As the data shows however, this is also currently the situation, in spite of legislations limiting the government's time for administering application to a total of 150 days, which in itself can be termed too long. As reported by the EPA officer, it now usually takes more than a year, which could undermine any hope that more *galamsey* register their operations to work legally and be subject to environmental control/guidance. The explained process is also rather tedious for the miner, due to the fact that he/she needs to approach both the Minerals Commission, as well as the EPA in addition to the District Assembly. Thus, in line with Hilson & Potter, it is clear that the process of registering is too complicated and expensive for the smallest-scale miners, who cannot afford the cost, time and alternative cost of both going to the institutions, as well as waiting for the granting of their licence (2003). Findings show that the total cost for retrieving a permit, is GHS 7463 for a minor-impact operation and GHS 13 233 for a small-scale operation. This is around 10 and 17 times more than the average GHS 750 farming income, thus illustrating that the cost is significant and might make many abstain from registration.

In the case of Amansie West, the registration procedure might now slightly improve, as the EPA is planning to open up a new office in Manso Nkwanta in 2014 (EPA Officer, Kumasi, 31.01.2014). This could enable prospective miners to come to the local office to at least initiated registration. Although, as a lot of the delays were mentioned not to be in the EPA but rather in the Minerals Commission, the process after having filed a registration application might not change much in length. On the other hand, what the office *can* contribute with is lowering the threshold for initiating the process of registering for the local population of Manso Nkwanta and its surroundings. The new office will also offer environmental education as well as monitoring of water pollution and similar issues (EPA Officer, Kumasi, 31.01.2014). If properly done, this might contribute with increased environmental awareness and hopefully a better understanding of the long-term consequences from selling their land to Chinese nationals.

The poor experience many small-scale miners have with the registration process, is also said to have led to rumours stating that the land one gets delegated as a registered miner often is of

low value, with limited amounts of gold (Carson et al., 2006). Naturally, this can contribute even more to the lack of interest in registering, and the environmental and social impact from the sector remains larger than necessary.

6.2.2 Policies and Mercury Pollution

"Small-scale gold miners shall observe good mining practices in the use of mercury for carrying out mining operations." (Mercury Act, 1989, § 4.2).

"Good mining practices" can here be interpreted in several ways, and is not clearly defined, thus determining whether the use is practiced lawfully or not becomes a very subjective matter. Using mercury in the extraction process is harmful to both the environment and the operators if very strict precautions are not taken. As described, the fumes spread very easily both airborne, but also through the soil and water. Having grounded by law what defines good mining practices with regards to using mercury, could give a better grass-root effect, as the different agencies responsible for regulating the small-scale mining sector does not have to interpret "good practices" in possibly different ways.

Paragraph 4.1 of the Mercury Act state that a licenced miner can rightfully buy a reasonable amount of mercury from authorized sellers to use for their mining operations (Mercury Act, 1989). In addition to leaving what is a reasonable amount open to interpretation, the law does not only make mercury widely available for the few legal small-scale miners, but also to the many informal miners, including the Chinese, which might not have enough knowledge about the caution needed when using it. A potential alternative to improve this could be to let the government be responsible for selling mercury, de-privatizing the sector. Sellers from the former private sector could be used as work force. They could be trained in being educators of good mercury practice, working closely with the EPA, as well as helping with the registration of the miners' operations, which would also be a requirement for purchasing the mercury.

In line with these findings, from the most developed countries in Africa, Ghana is one of the few that has not signed the treaty on Minamata Convention on Mercury. All neighbouring countries, as well as Zambia, Tanzania, Botswana and South Africa, to mention some, have signed the treaty. Even China has since October 2013 been a signatory (UNEP, 2014a). Therefore, the fact that Ghana is currently not part of the convention could serve to not only

undermine the improving the mercury situation in the country, but also serve to limit Ghana-China cooperation with regards to their ASGM sectors. The Minamata Convention clearly encourages the cooperation between its parties to cooperate with each other to achieve its objectives. It mentions examples such as education, outreach and capacity-building initiatives as well as the promotion of knowledge of *"best environmental practices and alternative technologies that are environmentally, technically, socially and economically viable"* (UNEP, 2013, p.7). Ghana's failure to sign the Minamata Convention also stands out as a strong contradiction to the government's claimed realization that mercury pollution is considered a priority environmental concern (Hilson et al., 2006, p.276). Had a sounder stance towards mercury use and regulations been taken by the government, the impacts in this regard might have been lower. Lastly, in line with Ayee et al., it can be argued that creating a follow-up policy to the Minerals and Mining Act 2006, could have improved the interpretation of the Act, and thus its implementation (2011).

6.2.3 Instrumental Use of Policies

As have been presented, the policies states that a license can be given to an individual being a citizen of Ghana or a group only consisting of citizens. As they are currently formulated they only state that the individual or group that registers has to be Ghanaians. However, it does not explicitly say that foreigners cannot help registered locals (Mining Act, 2006, § 83). Findings have shown that this is used to the Chinese's advantage. Both statements from the EPA and the director of WACAM support this. The former said that most Chinese are now only partnering with already registered local miners, where they formally serve as suppliers of technology, rather than actual mining. The latter source confirms this by stating that the task force operations now often do not target Chinese, as they are mitigating the laws by claiming to only help them work and provide the technology, again, to miners that are registered and legal. This situation can thus make the issue very difficult to solve, implicating that a clearer definition of the laws concerning Ghanaian's exclusive right to conduct small-scale mining could be advantageous.

6.2.4 Sufficient Policies?

For policies to be adequate, it can be argued that they should contribute to a better outcome for the average population in a long-term perspective, if meticulously implemented.

In line with Teschner's view, it has become clear that many aspects of the SM policies are no longer adequate (2012). This is partly rooted in the fact that findings confirm that the increase of mechanized mining, both within the formal and informal small-scale mining, has been allowed to settle as a practice due to low enforcement. As Teschner mentions, the laws were initially made to target families, and small groups that underwent simple mining without mechanical equipment, and in fairly low quantities. Now, however, it has become the norm much due to the Chinese, to practice mining using heavy machinery. Thus, due to bad policy implementation, which as seen also includes enforcement of the EIA regulations, the incentive for remaining unregistered and take use of heavy machinery and more effective (yet illegal) mining practices without being monitored, is indicated to have increased. With the rise of rural prices here uncovered, for the miners to go back to simple inefficient extraction methods, could deem their income limited in relation to the higher living costs. However, as findings show, the district's government are now confiscating the machines used by the *galamsey*, aiming at reducing their use. Although, in spite of these initiatives, people are still able to rent new excavators, and the form of mining will most likely persist, regardless of how high the risk of confiscation is, because of the much higher income they get. Hence, this illustrates the difficult challenge the government meets when having to regulate an illegal sector, which is essentially what is needed as so many local miners are unregistered.

6.2.5 Participation and Accountability

The level of participation in the implementation of the policies is done to a various extent. By interviewing the EPA office, it seems the practice of following the policy requirement of informing the communities in a period of 21 days about a potential mining licence given in their area is generally done. However, this is the only requirement of public participation stated in policies related to small-scale mining and environmental protection. Thus, for this participation mechanism to have any effect, it is crucial that the community members have sufficient knowledge about the potential effects a small-scale mining operation can have on them. Findings showed that they are aware of the severity of mercury's toxic effects only to some extent, while being fully aware of land degradation. Since several farmers have sold their land to Chinese, it is also plausible to believe that many were unaware of the broader consequences before they were a fact. Thus, information and education of community members could have been higher, and in this way have contributed to a higher degree of peoples' agency over their own situation by enabling informed participation, which according

to Tadesse and Sutton is so central (Tadesse et al., 2006; Sutton, 1999). Contrary to the latter theorist's view, it seems the government is not sufficiently seeing the formulation and implementation of policies as the same process, but rather as two separate ones (Sutton, 1999). In line with Hilson et al.'s theory, findings indicate that the current government-miner interaction does not sufficiently include the *galamsey*, and the focus is primarily on the registered small-scale miners (2006). Thus, this excludes the majority of workers in the sector. It can further be argued that it also undermines chances of reducing *galamsey* and its impacts. More specifically, the low inclusion of *galamsey* in these participation processes can be rooted in that they fall outside the policy framework. Another potential reason is what Ayee et al. describes as a situation where many MPs are also members of boards in mining companies (2011). As *galamsey* are often seen as a threat to mining companies, this could have fostered the trend where illegal miners' role in the situation have been downplayed, and only treated as a menace and obstacle to the companies- and country's progress. Thus, it might not be realized that their inclusion in policy process might also be in the interest of the large-scale mining sector, as it can foster a long-term solution to the *galamsey* issue, as Tschakert & Singha postulates (2007).

Further, the described lack of participation and information between the government and *galamsey,* can imply certain caveats with regards to accountability. In line with Kpessa, poorly informed community members could make participation serve its opposite purpose (2011, p.37). With a poorly informed population/community, public participation might have its contrary effect where the government's accountability can be reduced. This is rooted in that it can be argued that the community is given agency simply through the presence of some channels for participation, thus making them partly responsible for any negative outcomes. As findings show however, information-spreading and awareness rising to *galamsey* have not been done a significant extent in the Amansie West District, as many were unaware of both the laws, and to some extent the health-effects.

Since 2009, Ghana has been compliant of the described Extractive Industries Transparency Initiative. As this is to foster higher transparency with regards to government income from the extractive sector, it is the first step in decreasing higher-level corruption. In addition to this, the initiative can also, through its participation and transparency mechanisms, contribute to a situation where the grass-root is now able to hold the government more accountable with regards to the spending of these revenues. Although the EITI is now implemented; openness

regarding the income's actual use is still very limited or close to absent, implying there is significant room for improvement. Simply knowing the quantity of the income, combined with a situation where this income does not benefit the population or revealing where it is going; only replaces ignorance with frustration.

6.2.6 Awareness and Implementation

As uncovered in section 5.2.4, there might be cases of unawareness regarding Ghana's policies from the Chinese side. There is said to be no supporting institutions the Chinese can consult when in, or going to Ghana to do "business". As uncovered, many Chinese came from the Shanglin County to Ghana just because everybody else did so. Thus, active consideration of whether or not it is in accordance with Ghana's laws might not have been done, taking this for granted. Hence, while the leaders of the operations likely are aware of the illegality of their activities, it is not necessarily the case of those who follow them. It can therefore be argued that awareness rising in the relevant communities in China is crucial with regards to decreasing the influx. Hopefully, spreading stories of deportation might also serve this purpose to some extent.

In combination with cultural aspects, the laws regarding land ownership is found to be difficult to implement, playing a significant role in allowing the Chinese *galamsey* to operate. The line between governmental law and the traditional customs and rules seems to be blurry. This is partly rooted in the fact that Chiefs traditionally are seen to be in charge of all land in a certain area, and is authorized to delegate this land as he chooses. As uncovered, §1 in the Minerals and Mining Act, Act 703, directly contradicts this, stating that the government owns the land if it contains valuable minerals (Mining Act, 2006). Due to the grass-root potentially being more familiar with the traditional customs of land ownership, rather than the official laws, this might serve as a factor to poor implementation of the official laws. As found, the Chinese often approach the local Chiefs and ask for their permission to use the land offering them money. Some Chinese even approached local Chiefs claiming to have the permission of the regional Chief, which as explained was not possible for the local Chief to falsify due to it implicating lack of respect for the former. These matters make the whole situation rather confusing, and who delegates the land might not even be entirely clear to the Chiefs, Chinese, or the farmers, who apparently sell their land in "good faith". Hence, this implies that

implementation of policies inspired by the West's formulations in a country like Ghana, with a very diverse and different culture entailing traditional land tenure systems is very difficult. In relation to the issue discussed in this thesis, it also shows to be a potential contributor to enabling the Chinese to operate.

Another related issue is the level of government officials' awareness. Clause 83 from the Minerals and Mining Act 2006, as seen in section 5.2.1, states that one has to be a citizen in order to be a licensed/legal miner, and that citizen here is defined as a person or group existing exclusively of Ghanaians. Of the same clauses it is understood that small-scale mining done by corporations, has to be exclusively made up of individuals with Ghanaian citizenship, thus making it impossible for foreigners to engage in small-scale mining at all. Hence, if understood in this way, contrary to what the EPA officer claimed, the Chinese miners who cooperate with local licensed miners are per definition not seen as a legal group of mining operators. As this is an official having worked closely with small-scale mining issues in relation to environment, it could imply that the awareness of policies might be limited among several official personnel, thus undermining their proper implementation.

Lastly, through the relative low awareness among *galamsey* of what defines an illegal miner, it is clear that implementation of any small-scale mining polices, which requires registration, becomes very difficult. Thus, in line with Hilson et al.'s theory, the government's interaction with illegal miners is plausibly low, and serves as a major obstacle to improving the situation (2006, p. 4-5).

6.2.7 Farming and Alternative Livelihoods

It was stated by a farmer that the government are failing to provide the promised amount of fertilizers to them. It can be argued that this lowers the worth of the farming sector further. This in turn, might make it more probable for farmers to sell their land for Chinese *galamsey* activities, and for young people to choose *galamsey* over farming. Hence, the government's focus should be to foster increased income within the farming sector. This could not only improve the livelihoods of the farmers, but by doing so, also reducing the amount of people going into *galamsey* contributing to making the communities' future bleak. Using Wegner's theory, the average potential of increasing individual farming output in Ghana is as much as 3 times the current volume (2012, p.6). This could potentially contribute to a threefold increase

in income for the farmers of the mining communities, thus giving them an average yearly income of GHS 2250. Although this amount still only constitutes around 1/7 of local *galamsey's* annual income, it could make it more desirable to be a farmer than what is currently the situation, at least if combined with education regarding the long-term consequences of the mining.

In addition to this, it was found that NYEP, a programme that increased the amount of youth going into other sectors than mining, as well as the same time enabled *galamsey* to become registered and more environmental friendly, was terminated by the government in 2013. The discussed corruption is seen to have played a role in this termination, and might also have been combined with some siphoning of money done by the department. This is arguably not a very conducive move, and further diminishes the government's credibility when saying that dealing with the *galamsey* sector is a priority. Further, this decision might be a contributor to the current intensity of the *galamsey* sector, as it made so many unemployed.

6.2.8 Corruption

In line with Transparency International's data, ranking Ghana at 46 points on the corruption index scale, it has been found that the method is broadly used on the ground. This combines with the fact that the perceived level of corruption in the country has increased between 2007 and 2010. This trend is further supported by findings stating that government effectiveness and control of corruption declined between 2007 and 2012 (World Bank, 2013). This can be said to support Busse and Göning's study showing that having natural resources, in the case of developing countries, clearly increases corruption rates (2011). This could be rooted in a process where one party holds large funds – as in this case Chinese with a lot of lent money trying to get access to land - desires something which requires the approval of another party with minimal funds (in this case, the border control staff, and local officials). With this financial imbalance present, the likelihood that the party holding the funds gets what it desires (in this case to cross the border or get access to land) is very high, thus facilitating corruption.

Thus, as corruption is rather prevalent in Ghana, and perhaps increased by Chinese bribing-practices in the country, it is argued that it serves as a key obstacle to proper implementation of Ghana's mining policies. Through findings, it can further be argued that it is a central factor in enabling the Chinese *galamsey's* presence. In this regard, the whole situation can be seen as being reminiscent of certain aspects of the resource curse, as conflict, violence and

corruption are seen to be partly rooted in the country's holding of resources. However, this is not the same as stating that Ghana is experiencing the resource curse; only aspects associated with it.

An additional factor to why the Chinese have been allowed to operate to the extent they have is the fact that according to perception indexes, Ghanaians perceive the police to be the most corrupt institution. Ranked 4.6 out of 5 and with 79% of Transparency International's respondents having been in contact with police stating to have bribed them, it is clear that trust in the institution's capacity to enforcing their role in the society is also very low. This can not only enable easier operation and access to land for the Chinese, but perhaps more importantly; it can also hinder the implementation of the mining policies with regards to local small-scale miners. Such a conclusion is rooted in the likelihood that the incentive for artisanal gold miners to register is very low when they have no fear of being sanctioned if they fail to do so.

6.2.9 Implementation by Force

The task force established by the president has partly had the desired effect and the number of Chinese *galamsey* did decrease. An additional effect was that it increased the amount of miners showing up to register, as it increased people's awareness of mining regulations and policies. This was also manifested in the fact that the EPA officer reported that many Chinese now cover up the soil when finished mining and some even try to comply with the EPA's condition of staying 100 metres away from river bodies. At the same time however, it also showed that using force, instead of preventive measures has not lead to sustainable results, but rather a continued influx of Chinese *galamsey*, now increasing again and often consisting of formerly deported miners. Further, as only 4500 of the estimated 20-50 000 Chinese miners were deported in 2013 (Hirsh, 2013), it shows that the places the task force made a difference must have been limited. From this realization, it becomes clear that border control is an important prerequisite for more sustainable task force operations, which we now turn to.

6.2.10 Border Control and Immigration

Sufficiently implementing Ghana's policies with regards to immigration and border control would not solve the entire problem, as one can never prove a person's intentions in the country. However, as have been uncovered, many of the Chinese *galamsey,* who are now

growing in quantity again, are individuals who have already been deported from Ghana. This shows that the trend of entering Ghana through its neighbouring countries is in-fact a widely used method of getting to the mining areas. Thus, implementing these policies in a good way, could serve to at least limit the influx of deported miners, which if combined with persistent and targeted task force operations deporting all Chinese *galamsey*, could have a significant impact. The implementation however, is found to be executed very poorly. A main contributor to this is the described widespread corruption in agencies responsible for immigration and border control. This is found not only to be the issue within Ghana, but also at the Ghanaian embassy in China, which are willing to issue mass visas through agents serving as middlemen. Thus, the issue of corruption does not only have to be dealt with at the departments within Ghana, but also the country's departments in China. Further, the border control of Ghana is victim to the general lack of resources, both with regards to equipment and in human resources. This can be argued to be rooted in Ghana's wider government capacity issue, to which the discussion now turns.

6.2.11 Government Capacity

It is found that the government's distribution of mining royalties significantly deprioritizes the rural remote districts, where in-fact a lot of the income originates. In addition to not being distributed to the right regions, in line with Carson et al.'s findings, it show that 80% of the income stays with the national government, with only 4.95% being distributed to the District Assembly, one of the departments responsible for enforcing the mining laws (2006). Furthermore, it can be seen that the 10% cut of mining royalties which is set off for the Minerals Development Fund intended to benefit the grass-root and their needs, might not serve its purpose. In 2010, this amounted to GHS 16.2 million of which only 11.3 million were spent. However, looking at the EITI report again, it shows that 3.6 million of these were spent on salaries in distressed mining companies, and 7.7 million on developmental services of agencies/institutions in the mining sector (Ministry of Finance and Economic Planning, 2013, p.28). 7.7 million are clearly not a significant amount in a national scope, and shows that less than half of the 10% is spent for what it is intended, at least officially. More specifically it is uncovered that the EPA did not receive anything from this cut, even though that being the agency carrying the main responsibility for dealing with physical impacts rooted in mining. Further, there are not any transparency of the 7.7 million's spending record in the agencies and institutions, thus not enabling people to see if anything in-fact is

benefitting the grass-root of the mining communities. Thus, by having examined the EITI report, contrary to Roe & Jonathan's postulations in 2007, it is uncovered that Ghana's compliance to EITI since 2009 has not contributed to solving these issues of poor distribution of the government's mining income (2007).

These conclusions can further be argued to serve as a key reason to under-funded District Assemblies, EPA, and the Minerals Commission, which as seen do not have sufficient capacity or equipment to properly implement the mining policies, including dealing with the Chinese *galamsey* and preventing their return to Ghana. In line, with Hilson et al.'s argument that the EPA is more of a bureaucratic moneymaking machine, rather than an organization that meets their responsibility of implementing EIA regulations (2006, p.9), they received a score of 0 out of 100 in 2013 regarding the latter (Revenue Watch Institute, 2013). This poor capacity is thus manifested not only through the on-going presence of the Chinese and local illegal miners, but also through the poor implementation of the EIA regulations.

This discussed lack of capacity is confirmed by empirical findings showing that the government has not paid sufficient attention to community needs like infrastructure and other necessities. In some cases the government was even reported to ignore community members when they approached them stating their needs. This combines with findings indicating negative sentiments in the community towards the local government. These sentiments could further be argued to influence people's willingness to approach the government, pay large fees, and having to stick to a designated 25-acre area, which are aspects included in choosing to register. This situation can be postulated to make the welcoming of the Chinese *galamsey* in the area higher than it would have been with proper governmental follow up and support of the villages. This is rooted in the fact that Chinese *galamsey* have been reported to meet these needs where the government has failed, through the described CSR-reminiscent initiatives. Thus, even though respondents seemed to be aware of the negative aspects to some extent, some still preferred to have them around due to the positive impacts mentioned. Pairing this with the lucrative 20-30% cut that is given to locals who register land in their own name for the Chinese miners, implies that helping the Chinese and becoming their partner, can be a highly sought after position for locals (as shown in figure 18).

A last manifestation of the government's relative low capacity is the critical lack of Small-scale Mining District Offices, the entities responsible for promoting registration and help

galamsey. As it only exist seven such offices nationally, where even three whole regions do not have a single office, the effects these offices can have has to be limited.

6.2.12 Conflict of Interest

It has been postulated that the government possibly hold an economic interest in not dealing with the *galamsey* sector. This is rooted in the fact the PMMC is known to buy from both the legal- and illegal sector. Thus, this might also include the Chinese *galamsey*. These postulations can be strengthened by pairing three factors. As stated by Song, 40 per cent of the gold output from Ghana in 2011 is said to come from mines owned by Chinese (2013). Looking at appendix 1, it reveals that PMMC's exports increased from an annual average of 38 738 ounces between 1989 and 2007[25], to 238 480[26] ounces annually between 2008 and 2011. This being the timespan where the Chinese influx drastically increased, it becomes likely that the government generates a substantial income from the Chinese operations, as well as the increased ASGM activity they have contributed to. If so, this would serve to further confirm Hilson & Pardie and Teschner's theories, who both claim that the PMMC also buy from the *galamsey* (Hilson & Pardie, 2003; Teschner, 2012). Hence, this might serve as a conflicting interest in dealing with the Chinese *galamsey* issue, as the government potentially benefits economically from their presence.

This conflict of interest can be termed even more significant when combined with the economic cooperation between the two countries, something applied force towards the Chinese in Ghana could potentially threaten. Within this assumption also lies another core issue; the fact that politically, in relation to the Chinese, it is very important for Ghana to express and communicate that all *galamsey* are targeted with the task force, not exclusively the Chinese (Government of Ghana, 2013a). However, since so many thousands of Ghanaians directly depends on the income from *galamsey*, this is very difficult to execute, and perhaps not preferable for the government. In this way, it can be argued that if the current policies were to be meticulously implemented, without changing the framework to enable higher registration, it would likely lead to increased poverty among the population as 85% of the miners (*galamsey*) would have to be stopped. Thus with the current policy framework and political situation, the issue remains very complicated.

[25] Adding numbers from 1989 to 2007 from table in appendix 1 dividing by 17
[26] Adding numbers from 2008 to 2011 from table in appendix 1 dividing by 4

6.3 Political Implications

As China is Ghana's main trading partner, the *galamsey* situation can prove to have wider repercussions than just the mentioned social, environmental and economic ones. China having their own nationals forcefully deported in such large quantities is most likely not welcomed by the Chinese government, and might serve to diminish the good relationship between the two countries. This implies a potential decrease in trade and China's role as a source of capital for Ghanaian businesses and infrastructure projects. The minister of lands and mines in Ghana reports that after the 2013 deportation, there is seen a tightening of the visa procedures for Ghanaians wanting to go to China (Hirsh, 2013). Without any certainty, this could be as a direct result from the deportation, but is not sufficient for any conclusions to be made. In addition, China has delayed its granting of access to a USD$ 3 billion loan to Ghana that was agreed before the deportations, which might strengthen the perception that their actions are a manifestation of their dissatisfaction. Thus, in this regard, simply continuing to deport the Chinese *galamsey*, might not be a sound solution in the long run. Cooperation with the Chinese government to find and share alternatives for the miners in the few areas where most of them come from might be a better solution, which could serve to strengthen the relationship rather than potentially damaging it.

Other aspects that might serve to be an obstacle to the Ghana - China relationship, are the impacts the Chinese *galamsey* seems to have on many Ghanaian's attitude towards the Chinese. In addition to the presented data, most persons living in the urban part of Kumasi with which the researcher trivially discussed the issue, said that they did not like the Chinese, and that they are no good to their country. Thus, it is clear that the issue is very familiar to most people, as news coverage has been very frequent. However, based on Ghanaian news-sources used in this thesis, it is seen that the coverage is very one-sided, and that it does portray the Chinese simply as crooks taking advantage of the country's resources, rather than revealing the complexity of the situation. More specifically, the researcher has not been able to retrieve any Ghanaian news articles writing about the ways in which the Chinese benefit some parts of the communities economically, as has here been found. Hence, covering the situation not more nuanced than what is currently being done, can serve to increase potential anti-Chinese sentiments, which further makes investment and China - Ghana cooperation more difficult.

Chapter 7: Conclusion and Recommendations

In this chapter, some short conclusions, or a summary of indications and their relation to theory, are presented. Following this comes some humble recommendations for potential actions that could serve to improve the situation, the way the researcher sees it.

7.1 Conclusions

With regards to research question one; it is indicated that the impacts of the Chinese *galamsey* on the local communities are manifold; some positive and some negative. The environmental impacts of their operations are clearly those with the highest short- and long-term costs for the community members and Ghana in general. Using Asiedu's theory, the total minimum cost of reclaiming the farmland that has been used by Chinese for galamsey activities in Amansie West has been calculated to be between GHS 64 million and 108 million. Thus, the environmental impact, and its effect on the farming sector in the area, can be long-lasting, as reverting the land to suitable farmland, is highly expensive. Combined with mercury emissions, the environmental impact from the Chinese *galamsey* can only be termed disastrous in character. However, looking at the economic impact on the local communities, the total impact's character is not clear-cut. Farmers, does generally seem to be the main losers, as they either sell their land, or gets their farmland polluted deeming it infertile, thus losing their source of income. The local illegal miners however, are the economic winners, as they have adopted Chinese practices and are now able to earn substantially more. Local *galamsey* working with the Chinese are seen to earn an even higher amount. Thus, it is found that the so-called poverty trap postulated by Hilson and Pardie, is altered in the way that productivity and income have increased (2006). The main backside however, is that the Chinese influx has contributed to a higher general *galamsey* activity also intensifying its normal problems such as malaria, HIV, violence and land degradation, which according to findings, there are indications to support. In line with Lebel's theory, it has been uncovered that environment, communities and the economy are highly intertwined concepts, which are all affecting or constituting the quality of health (2003). Thus, findings indicate to confirm all theory applied regarding the general impacts of *galamsey*, but adding that they are now more intense, as well as more income-generating.

Looking at research question two, it has been found that the small-scale mining policies in the country, in line with Teschner (2012), are found to no longer be adequate. It has been

indicated that the registration process for local miners is too time-consuming and difficult, which ultimately leads more people into being *galamsey*, which further directly implicates mining done with low or no concern for the environment. This combines with a poor legal framework with regards to the handling of mercury, as well as loosely formulated policies related to protecting Ghanaians exclusivity in small-scale mining in Ghana. In line with Carson et al., it is found that the government lacks the necessary resources, both financially as well as competent work force (2005). This pairs with findings indicating that Ghana's relatively high corruption levels serve as a complimentary to Chinese miners' high susceptibility to apply bribing, which further partly enables them to do their work. In addition to this it has been found that the distribution of the income from mining is poorly done and executed in a manner where the grass-root and those negatively impacted from mining operations receive the least relatively to their stakes. Thus, structural problems within the small-scale mining sector and government have shown to be a central factor in the magnitude of the Chinese *galamsey* issue. This also entails the government's lack of succeeding in providing the rural areas in Amansie West with infrastructure and basic necessities that is argued to increase the Chinese's ability to get access to the areas, as they serve as a substitute to the government in this regard. Lastly, a potential conflict of interest, both economically and politically, is presented as a possible reason to late and insufficient governmental action.

7.2 Recommendations

The government should drastically increase their efficiency with regards to the process of registering as a small-scale miner, as this could increase the amount of registrations, and thus mining practices. One possible initiative could be to establish district ICT centers, where miners can register for a license in a common portal comprising both the EPA and the Minerals Commission's forms. This could remove the requirement of having to go to the Minerals Commission in Accra, and thus eliminate what is most likely seen as very inconvenient for the miners, and as the researcher's assistant described in a conversation: *"If I was I miner, why should I go to Accra, when the gold is here?!" (*Adubofuor, Solomon, 17.01.2014). As many potential miners lack access to financial services, but as much as 72.6 per cent have mobile phones[27], there could also be a possibility to pay their fees through e-payment using their phone credits, already applied in many services in Ghana. This would then have to be done on a monthly basis, rather than paying the amount initially and once

[27] See Table 1

every year. Furthermore, this could drastically increase the income-potential for vendors selling phone credit in the villages contributing to increased income for more families in the mining communities. Paired with this, the cost for registering should be significantly reduced, especially for the smallest scales of permits. The alternative cost of lost taxation from unregistered miners is likely much higher than what the government loses from cutting total registration costs to a fifth of the current level. Another potential improvement could be to de-privatize the mercury sector while still using sellers from the private sector as work force. As put forth, they could be trained to educate in good mercury practice, working closely with the EPA, as well as helping with the registration of the miners' operations, which would also be a requirement for purchasing the mercury. The mercury dealers would then serve as a resource in improving the sector, as well as making registration a prerequisite for mining, rather than a choice which it currently seems to be. Lastly, this could also serve to limit the Chinese's access to mercury.

Second, it has become clear that the border control in Ghana does have significant resource limitations that enable the Chinese to enter, in spite of having been deported. In addition to the lack of resources, reducing the level of corruption in these institutions should be of high priority to enable the prevention of Chinese that has broken the laws of Ghana to re-enter. Another action could be to foster increased cooperation with the same institutions in China, to reduce the amount of miners traveling to Africa. Ghana's *galamsey* issue is serious and intricate as it is, if not worsened by the Chinese influx.

Thirdly, the government should join the Minamata Convention in order to take the issue of mercury pollution seriously. This could also foster increased bilateral cooperation between the ASGM sectors of China and Ghana, and contribute to a higher level of understanding of the Chinese influx to Ghana, while at the same time improving the sectors in both countries.

Forth, and perhaps the most important conclusion that can be made of the discussions, is that the agricultural sector needs to increase its efficiency in order to make it a more desirable economic activity. Currently, the low income generated through farming is identified as one of the key reasons as to why the Chinese gets access to land, and why so many locals practice *galamsey*.

Bibliography

African Development Bank Group (2012). *Republic of Ghana Country Strategic Paper 2012-2016.* Retrieved (26.05.2014) from: http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Ghana%20-%20CSP%202012%20-%202016.pdf

African News (2013, 06.13). *1072 Chinese Gold Miners Return From Ghana.* Retrieved (31.04.2014) from: http://news.xinhuanet.com/english/africa/2013-06/13/c_132453312.htm

Alnæs, Kristin Mack (2003). *For en neve dollar: handel med Afrikas framtid.* Oslo: Solidaritet.

Amanor, Samuel (2013). *Chinese money for Ghana's natural resources: the real cost.* Retrieved (03.05.2014) from: http://www.consultancyafrica.com/index.php?option=com_content&view=article&id=1327:chinese-money-for-ghanas-natural-resources-the-real-cost&catid=87:african-finance-a-economy&Itemid=294

Amansie West District Assembly (2006). Agricultural Sector. Retrieved (22.04.2014) from: http://amansiewest.ghanadistricts.gov.gh/?arrow=atd&_=17&sa=887

Amansie West District Assembly (2009). Galamsey causing havoc. Retrieved (23.01.2014) from: http://amansiewest.ghanadistricts.gov.gh/?arrow=nws&read=30089

Amansie West District Assembly (2012). *The Composite Budget of the Amansie West District Assembly for the 2012 Fiscal Year.* Retrieved (16.02.2014) from: http://www.mofep.gov.gh/sites/default/files/budget/Amansie%20West.pdf

Anas, Anas Aremeyaw (2011). *Ghana Gold.* Film. Retrieved (26.03.2014) from: http://www.aljazeera.com/programmes/africainvestigates/2011/11/201111307131033193 1.html

Armah, F.A.; Luginaah, I.; Taabazuing, J.; Odoi, J.O. (2013). Artisanal Gold Mining and Surface Water Pollution in Ghana: Have the Foreign Invaders come to Stay*? Environmental Justice,* 2013, 6(3), 94- 102. Retrieved (29.04.2014) from: http://online.liebertpub.com/doi/abs/10.1089/env.2013.0006

Asiedu, J.B.K (2013). Techincal Report on Reclamation of Small Scale Surface Mined Lands in Ghana: A Landscape Perspective. *American Journal of Envirnonmental Protection,* 2013, Vol. 1, No. 2. Retrieved (05.03.2014) from: http://pubs.sciepub.com/portal/downloads?doi=10.12691/env-1-2-3&filename=env-1-2-3.pdf

Ayee, Joseph, Søreide, Tina, Shukla G.P, and Minh Le, Thuan (2011). Political Economy of Mining Sector in Ghana. *Policy Research Working Paper, World Bank*. Retrieved (05.12.13) from: http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-5730

Ayisi, Dr. Gabriel A. (2013, 16.06). Ghana Gold mines Suggest Larger Crisis for China. *Ghana Web*. Retrieved (17.10.13) from: http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=276946

Banchirigah, Sadia Mohammed (2008). Challenges with eradicating illegal mining in Ghana: A perspective from the grassroots. *Resources policy*, 33 (2008) 29-38. Retrieved (01.10.2013) from: http://www.sciencedirect.com/science/article/pii/S0301420707000724

Barker T., I. Bashmakov, L. Bernstein, J. E. Bogner, (…), D. Zhou (2007). Technical Summary. *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O. R. Davidson, P. R. Bosch, R.

Dave, L. A. Meyer (eds)], United Kingdom and New York, NY, USA: Cambridge University Press. Retrieved (11.11.13) from: http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-ts.pdf

Bariball, Louise K. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing,* 19, 328-335. Retrieved (28.04.2013) from: http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2648.1994.tb01088.x/pdf

Bazeley, Pat (2006). The Contribution of Computer Software to Integrating Qualitative and Quantitative Data and Analyses. *Research in the Schools*, Vol. 13, No. 1. Retrieved (30.04.2013) from: www.msera.org/Rits_131/Bazeley_131.pdf

Bax, Pauline (2012, 08.10). China's Gold Sparks Conflict With Illegal Chinese Miners. *Bloomberg.* Retrieved (13.10.13) from: http://www.bloomberg.com/news/2012-10-08/ghana-s-gold-sparks-conflict-with-illegal-chinese-miners.html

Bloch, Robin & Owusu, George (2012). Linkages in Ghan's Gold mining industry: Challenging the enclave thesis. *Resources policy*, 37, 434-442. Retrieved (26.05.2014) f rom: http://www.sciencedirect.com/science/article/pii/S0301420712000402/pdfft?md5=8320934037c388a79e76b2b64d028d05&pid=1-s2.0-S0301420712000402-main.pdf

Bloomberg News (2013). China's Africa Role Under New Scrutiny as Miners Expelled. *Bloomberg News.* Retrieved (07.05.2014) from: http://www.bloomberg.com/news/2013-06-06/chinese-county-warns-locals-from-going-to-ghana-to-mine-for-gold.html

Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, (2007). Africa. In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge UK, 433-467. Retrieved (31.05.2014) from: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter9.pdf

Bond, Patrick (2006). *Looting Africa: The Economics of Exploitation.* London, UK: Zed Books Ltd.

Booyenes, Yolandi (2012). Government preparing to ensure maximum benefits from the mining industry. *Mining Weekly*. Retrieved (18.11.13) from: http://www.miningweekly.com/article/government-preparing-to-ensure-maximum-benefits-from-mining-industry-2012-04-13

Bosshard, Peter (2013). Chinese loan could fuel regional conflict in East Africa. *China Dialogue*. Retrieved (14.11.13) from: https://www.chinadialogue.net/article/show/single/en/5601-Chinese-loans-could-fuel-regional-conflict-in-East-Africa

Botchway, F., (1995). Pre-colonial methods of gold mining and environ- mental protection in Ghana. *Journal of Energy and Natural Resources Law*, 13 (4), 299–311. Retrieved (02.02.2014) from: http://heinonline.org/HOL/Page?handle=hein.journals/jenrl13&div=41&g_sent=1&collection=journals#315

Boynton, Rachel (2013). *Big Men.* Film. Directed by Rachel Boyton. USA: Boynton Films Production.

Brautigham, Debohra (2011). *The Dragon's Gift: The Real Story of China in Africa.* USA: Oxford University Press.

Brooks, Andrew (2010). Spinning and Weaving Discontent: Labour Relations and the Production of Meaning at Zambia-China Mulungushi Textiles. *Journal of Southern African Studies*, 36:1, 113-132

Retrieved (28.04.2013) from: http://dx.doi.org/10.1080/03057071003607360

Bryman, Alan (2012). *Social Research Methods.* Oxford: Oxford University Press.

Busse, Matthias & Gröning, Steffen (2011). The Resource Curse Revisited: Governance and Natural Resources. *HWWI Research,* 106. Retrieved (31.05.2014) from: http://hwwi-rohindex.de/uploads/tx_wilpubdb/HWWI_Research_Paper_106.pdf

Campbell, B. (2003). Factoring in governance is not enough mining codes in Africa, policy reform and corporate responsibility. *Minerals and Energy,* 18 (3), 2–13. Retrieved (28.04.2014) from: http://www.er.uqam.ca/nobel/ieim/IMG/pdf/RMR-BCampbell-sept03.pdf

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56,* 81-105. Retrieved (23.04.2013) from: https://faculty.fuqua.duke.edu/~jglynch/Ba591/Session03/Campbell%20and%20Fiske%201959%20Psych%20Bull.pdf

Cardenal, Juan P. & Araújo, Heriberto (2013) *China's Silent Army – The Pioneers, Traders, Fixers and Workers Who Are Remaking the World in Beijing's Image.* USA: Penguin Group.

Carson, M., Cottrell, S., Dickman, J., Gummerson, E., Lee, T., Miao, Y., Teranishi, N., Tully, C., Uregian, C., (2005). *Managing Mineral Resources Through Public– Private Partnerships: Mitigating Conflict in Ghanaian Gold Mining*. Woodrow Wilson School of Public and International Affairs, Princeton, NJ. Retrieved (20.05.2014) from: http://www.princeton.edu/bobst/docs/WWS591c_Final_ReportMinerals_PDF.pdf

Condon, Madison (2012). China in Africa: What the Policy of Nonintervention Adds to the Western Development Dilemma. *The Fletcher Journal of Human Security*. Retrieved (19.05.2014) from: http://fletcher.tufts.edu/Praxis/~/media/Fletcher/Microsites/praxis/xxvii/2CondonChinaAfrica.pdf

Coullier, Paul (2008). *The Bottom Billion.* USA, New York: Oxford University Press.

Dansereau, Pierre (2003). Foreword. Lebel, J., *Health: An Ecosystem Approach*. (p.xi). Ottawa, Canada: IDRC books

DG Trade (2013) *Ghana - EU bilateral trade and trade with the world.* Retrieved (14.11.13) from: http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_122461.pdf

Dong, Liu (2013, 13.06). Chinese miners lured by Ghana's gold rush hit rock bottom after crackdown. *Global Times*. Retrieved (18.10.13) from: http://www.globaltimes.cn/content/788641.shtml#.UmAq7GQXzKk

Donkor, A.K, Nartey, V.K, Bonzongo, J.C, Adotey, D.K (2006). Artisinal Mining of Gold with Mercury in Ghana. *West Africa Journal of Applied Ecology*, Vol. 9. Retrieved (14.10.13) from: http://www.ug.edu.gh/iess/wajae/WAJAEWEBDESIGN/papers/paper_vol9/02%20papers9_artisanal_mining_of_gold_mercury_ghana_full.pdf

Donkor, A.K, Nartey, V.K, Bonzongo, J.C, Adotey, D.K (2007). Heavy Metals in Sediments of the Gold Mining Impacted Pra River Basin, Ghana. *West Africa, Soil and Sediment Contamination: An International Journal*, 14 (6), 479-503. Retrieved (20.08.13) from: http://dx.doi.org/10.1080/15320380500263675

Dougill, A.J., Fraser, E.D.G., Holden, J., Hubacek, K., Prell, C., Reed, M.S., Stagl, S.T., Stringer, L.C., (2006). Learning from doing participatory rural research: Lessons from the Peak District National Park. *Journal of Agricultural Economics* 57, 259–275. Retrieved (31.04.2014) from:

http://onlinelibrary.wiley.com/store/10.1111/j.1477-9552.2006.00051.x/asset/j.1477-9552.2006.00051.x.pdf?v=1&t=htgzflki&s=81a26cbc9b5aa9de880e33f6baccae7e2534f5c1

The Economist (2011,20.04). Trying to Pull Together. *The Economist.* http://www.economist.com/node/18586448?story_id=18586448

Embassy of the People's Republic of China in the Republic of Ghana (EPRCRG) (n.d) *Introduction of China-Ghana Relations.* Retrieved (14.11.13) from: http://gh.china-embassy.org/eng/zjgx/t177920.htm

Environmental Assessment (1999). *Environmental Assessment Regulations 1999.* Retrieved (27.05.2014) from: http://www.lexadin.nl/wlg/legis/nofr/oeur/arch/gha/EIAREGULATIONS.pdf

Essel, Isaac (2014, 05.05). Govt must come clean on $3bn loans tied to galamsey menace – K.T Hammong. *Joy Online*. Retrieved (23.05.2014) from: http://www.myjoyonline.com/news/2014/May-5th/govt-must-come-clean-on-3bn-loans-tied-to-*galamsey*-menace-kt-hammond.php

Extractive Industries Transparency Initiative (EITI) (2014a). *EITI Factsheet.* Retireved (13.05.2014) from: http://eiti.org/files/2014-03-26%20Factsheet%20English_0.pdf

Extractive Industries Transparency Initiative (EITI) (2014b). *Ghana*. Retrieved (13.05.2014) from: http://eiti.org/Ghana

Federal Research Division (1994). *Ghana - Country Profile.* Area handbook series, ISSN 1057-5294. Library of Congress Cataloging-in-Publication Data. Retrieved (05.01.2014) from: http://www.marines.mil/Portals/59/Publications/Ghana%20Study_1.pdf

Fees and Charges (2013). *Fees and Charges (Amendment) Instrument 2013, LI 2206 Regulation 8 (1).* Retrieved (07.05.2014) from: http://epaoilandgas.org/system/files_force/Approved%20Rates,%20Fees%20and%20Charges%202013%20(LI%202206).pdf?download=1

Gajigo, Ousman, Mutambatsere, Emelly, Ndiaye, Guirane. (2012). Royalty Rates in African Mining Revisited: Evidence from Gold Mining. *African Development Bank Group – Africa Economic Brief,* 3 (6). Retrieved (31.05.2014) from: http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AEB%20VOL%203%20Issue%206%20avril%202012%20Bis_AEB%20VOL%203%20Issue%206%20avril%202012%20bis_01.pdf

Ghana Districts (2013). *Background of the region*. Retrieved (05.01.2013) from: http://www.ghanadistricts.com/region/?r=2&sa=8

Ghana Districts (2014). *Regions.* Retrieved (27.05.2014) from: http://www.ghanaweb.com/GhanaHomePage/geography/region.php

Ghana Statistical Service (2012). *Revised Gross Domestic Product 2012.* Retrieved (26.05.2014) from: http://www.statsghana.gov.gh/docfiles/GDP/revised_GDP_2012_v4_P+E.pdf

Ghana Web (2013). *The Country Ghana.* Retrieved (13.11.13) from: http://www.ghanaweb.com/GhanaHomePage/country_information/

Ghana Web (2014). *SOCIAL: New districts inaugurated, MMDAs now 2016.* Retrieved (27.05.2014) from: http://www.ghanadistricts.gov.gh/news/?read=46228

Google Earth (2014). *Ghana, Manso Nkwanta*. Retrieved (06.02.2014) from: https://www.google.com/maps/@6.4604833,-1.8877739,5112m/data=!3m1!1e3

Google Maps (2013a). *Ashanti, Ghana.* Retrieved (13.10.13) from: https://www.google.com/maps

Google Maps (2013b). *Ghana.* Retrieved (13.11.13) from: https://www.google.com/maps/preview#!data=!1m4!1m3!1d5663739!2d-1.0307118!3d7.9527706

Gordon R.L. (1975). *Interviewing: Strategy, Techniques and Tactics.* Dorsey Press, Illinois.

Government of Ghana (2013a). *Illegal Mining Will Not Affect Ghana – China Relations.* Retireved (07.05.2014) from: http://www.ghana.gov.gh/index.php/2012-02-08-08-32-47/general-news/700-illegal-mining-will-not-affect-ghana-china-relations

Government of Ghana (2013b). *Introduction – Ashanti Region.* Retrieved (16.10.13) from: http://ghana.gov.gh/index.php/about-ghana/regions/ashanti

Government of Ghana (2013c). *Ghana Revolution And Political History.* Retrieved (26.05.2014) from: http://www.ghana.gov.gh/index.php/about-ghana/ghana-at-a-glance/447-ghana-revolution-and-political-history

GRID Arendal (2012). *World Population Development.* Retrieved (30.08.2013) from: http://grida.no/graphicslib/detail/world-population-development_29db

Gueorguieva, Ralitsza V. (…) Resnick, Michael B. (2001). Effect of Teenage Pregnancy on Educational Disabilities in Kindergarten. *American Journal of Epidemiology,* 153, 212-220. Retrieved (08.04.2014) from: http://aje.oxfordjournals.org/content/154/3/212.full.pdf

Hilson, Gavin (2003). Gold Mining as Subsistence: Ghana's Small-Scale Miners Left Behind. *Cultural Survival*. Retrieved (10.03.2014) from: http://www.culturalsurvival.org/publications/cultural-survival-quarterly/ghana/gold-mining-subsistence-ghanas-small-scale-miners-lef

Hilson, Gavin (2002) Harvesting riches: 1000 years of gold mining in Ghana. *Resources policy*, 28 (2002) 13-26. Retrieved (21.11.13) from: http://www.sciencedirect.com/science/article/pii/S0301420703000023/pdfft?md5=0eb9a1f0175c76c87c20b773d36e562f&pid=1-s2.0-S0301420703000023-main.pdf

Hilson, Gavin (2001) A Contextual Review of the Ghanaian Small-scale Mining Industry. *Mining, Minerals and Sustainable Development,* 76. Retrieved (09.11.13) from: http://www.hsph.harvard.edu/mining/files/Hilson_on_Ghana.pdf

Hilson, Gavin, Hilson, Christopher J., Pardie, Sandra (2006). Improving Awareness of Mercury Pollution in the Small-Scale Gold Mining Communities: Challenges and Ways Forward in Rural Ghana. *Environmental Research,* 103 (2), 275-287. Retrieved (07.04.2014) from: http://www.sciencedirect.com/science/article/pii/S0013935106002246

Hilson, Gavin & Pardie, Sandra (2006). Mercury: An agent of poverty in Ghana's small-scale gold-mining sector? *Resources Policy,* 31 (2006) 106-116. Retrieved (02.12.13) from: http://www.sciencedirect.com/science/article/pii/S0301420706000328/pdfft?md5=f6bdfdb5b50f1d404693e2be370ce5bf&pid=1-s2.0-S0301420706000328-main.pdf

Hilson, Gavin & Potter, C. (2005). Structural Adjustment and Subsistence Industry: Artisinal Gold Mining in Ghana. *Development and Change,* 36 (1): 103-131. Retrieved (20.05.2014) from: http://www.ddiglobal.org/login/Upload/Struct%20Adjust%20and%20Subsistence%20Industry_Artisanal%20Gold%20Mining_%20Ghana.pdf

Hilson, Gavin & Potter, C. (2003). Why is illegal gold mining activity so ubiquitous throughout rural Ghana? *African Development Revue,* 15 (2), 237–270. Retrieved (16.05.2014) from: http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8268.2003.00073.x/pdf

Hirsh, Afua (2013, 15.07). Ghana Deports Thousands in Crackdown on Illegal Chinese Goldminers. *The Guardian. Retrieved (*26.03.2014) from: http://www.theguardian.com/world/2013/jul/15/ghana-deports-chinese-goldminers

Huifeng, He (2013a, 07.06). Guangxi Protesters Demand Beijing Aid Gold Miners Caught in Ghana. *South China Morning Post*. Retrieved (01.04.2014) from: http://www.scmp.com/news/china/article/1255146/guangxi-protesters-demand-beijing-aid-gold-miners-caught-ghana

Huifeng, He (2013b, 07.06). Low Costs and Huge Profits Irresistible Lure for Chinese to Mine Ghana's Gold. *South China Monring Post*. Retrieved (01.04.2014) from: http://www.scmp.com/news/china/article/1255126/low-costs-and-huge-profits-irresistible-lure-chinese-mine-ghanas-gold

IPCC (2007). *Climate Change 2007: Synthesis Report*. Retrieved (22.04.2013) from: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

Jiao, Yang (2013). Guest Post: Chinese Illegal Gold Miners in Ghana. *China in Africa: The Real Story*. Retrieved (15.03.2014) from: http://www.chinaafricarealstory.com/2013/06/guest-post-chinese-illegal-gold-miners.html

Johnson, R. Burke, Onwuegbuzie, Anthony J. and Turner, Lisa A. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research,* 1, 112-132. Retrieved (28.04.2013) from: http://mmr.sagepub.com/content/1/2/112.full.pdf+html

Kane, Mouhamadou (2013). Ghana Takes Action Against Illegal Chinese Miners (26.03.2014) from: http://issafrica.org/iss-today/ghana-takes-action-against-illegal-chinese-miners

Kumasi Metropolitan Assembly (2006). About this Metropolis. Retrieved (13.11.13) from: http://kma.ghanadistricts.gov.gh/?arrow=atd&_=6&sa=5477

Lebel, J., (2003) *Health: An Ecosystem Approach*. Ottawa, Canada: IDRC books.

Levin, Dan (2013, 29.06). Ghana's Crackdown on Chinese Gold Miners Hits One rural Area Hard. *The New York Times.* Retrieved (07.02.2013) from: http://www.nytimes.com/2013/06/30/world/asia/ghanas-crackdown-on-chinese-gold-miners-hits-one-rural-area-hard.html?pagewanted=1&_r=0

The Levin Institute (2013). *The Resource Curse*. Retrieved (06.11.13) from: http://www.globalization101.org/the-resource-curse

Li, Hanwei (2013). Chinese Illegal Miners in Ghana. *Africa Daily.* Retrieved (07.05.2014) from: http://www.theafricadaily.com/5/post/2013/08/chinese-illegal-miners-in-ghana.html

Maathai, Wangari (2009). *The Challenge for Africa.* United States, New York: Anchor Books.

Marshall, Alfred (1920). *Principles of Economics.* London: Macmillan and Co., Ltd. Retrieved (10.03.2014) from: http://www.econlib.org/library/Marshall/marP.html

McNamee, Terrence (2012). *Africa in their words – A study of Chinese traders in South Africa, Lesotho, Botswana, Zambia and Angola.* The Brenthurst foundation. Retrieved (29.04.2013) from:

http://www.thebrenthurstfoundation.org/files/brenthurst_commisioned_reports/Brenthurst-paper-201203-Africa-in-their-Words-A-Study-of-Chinese-Traders.pdf

Mercury Act (1989). P.N.D.C.L 2017 - Mercury Act 1989. Retrieved (09.04.14) from: http://www.clientearth.org/external-resources/ghana/mineral-mining-gas-and-petroleum/1989%20MERCURY%20ACT%20PNDCL%20217..pdf

Michel, Serge & Beuret, Michel (2009). *China Safari – On the Trail of Beijing's Expansion in Africa.* New York: Nations Books.

Mining Act (2006). The Minerals and Mining Act, 2006. Retrieved (14.10.13) from: http://www.sdsg.org/wp-content/uploads/2011/06/Ghana-Minerals-Act-2006.pdf

Ministry of Finance and Economic Planning (2013). Aggregation/reconciliation of Mining Sector Payments and Receipts: 2010-2011. Retrieved (24.05.2014) from: http://eiti.org/files/Ghana-2010-2011-EITI-Report_0.pdf

Ministry of Food and Agriculture (2013). *Amansie West.* Retrieved (05.02.2014) from: http://mofa.gov.gh/site/?page_id=837

Modern Ghana (n.d). Executive Summary. *Modern Ghana.* Retrieved (13.05.2014) from: http://www.modernghana.com/GhanaHome/regions/ashanti.asp?menu_id=6

Mohan, Giles (2010). *China in Africa: Easing the Shift from Aid Dependency to Oil Economy? (ARI).* Real Instituto Elcano. Retrieved (01.04.2014) from: http://www.isn.ethz.ch/Digital-Library/Publications/Detail/?ots591=0c54e3b3-1e9c-be1e-2c24-a6a8c7060233&lng=en&id=122669

Moyo, Dambisa (2011). *Dead Aid.* London, England: Penguin Books.

Moyo, Dambisa (2012). *Winner Take All.* New York, USA*:* Basic Books.

Müller-Kruckelberg, Kristina (2012). *Climate Change and its Impact on the Livelihood of Farmers and Agricultural Workers in Ghana. Germany:* Friedrich Ebert Stiftung. Retrieved (03.11.13) from: http://www.fesghana.org/uploads/PDF/Study_ClimateChangeLivelihood_FINAL.pdf

Myxter, Erik (2013). "Shanglin county clique's" African Gold Rush: Get Rich or Die Trying (translation). *The China Africa Project.* Retrieved (06.02.2014) from: http://www.chinaafricaproject.com/shanglin-county-cliques-african-gold-rush-making-a-fortune-or-die-trying-translation/

Nation Master (2014). *Facts and Stats about Ghana*. Retrieved (27.03.2014) from: http://www.nationmaster.com/country/Ghana

Negi, Rohit (2008). Beyond the "Chinese Scramble": ThePolitical Economy of Anti-China Sentiment in Zambia. *African Geographical Review*, 27 (1), 41-63. Retrieved (30.04.2013) from: http://dx.doi.org/10.1080/19376812.2008.9756209

Noetstaller, R., (1996). Keynote address. In Barry, M. (Ed.), *Regularizing Informal Mining: A Summary of the Proceedings of the International Roundtable on Artisanal Mining*. Organized by the World Bank, May 17–19, 1995, Industry and Energy Department Occasional Paper No. 6, Washington. Retrieved (31.05.2014) from: http://www.hsph.harvard.edu/mining/files/Barry.pdf

Odoi-Larbi, Stephen (2013). Youth Employment Program Abandoned. *Modern Ghana.* Retrieved (16.05.2014) from: http://www.modernghana.com/news/456294/1/youth-employment-program-abandoned.html

OECD, 2013. *Foreign Direct Investment.* Retrieved (31.05.2014) from: http://www.oecd-ilibrary.org/sites/factbook-2013-en/04/02/01/index.html?itemId=/content/chapter/factbook-2013-34-en

Owosu-Sekyere, Dr. Ebenzer (2009) in *Galamsey causing havoc.* (23.01.2014) from: http://amansiewest.ghanadistricts.gov.gh/?arrow=nws&read=30089

Peace FM Online (2014). 29 Year Old Hair Dresser Killed in Galamsey Pit. *Peace FM Online.* Retrieved (26.03.2014) from: http://www.apastyle.org/learn/faqs/web-page-no-author.aspx

Pegg, S. (2006). Mining and poverty reduction: transforming rhetoric into reality. *Journal of Cleaner Production*, 14 (3–4), 376–387. Retrieved (11.11.2013) from: http://www.rosiamontana.ro/img_upload/472936e3bca2bc61045730fbb1869240/Mining_and_Poverty.pdf

Precious Minerals Marketing Company (PMMC) (2012). *Gold Production and Marketing.* Retrieved (05.05.2014) from: http://pmmcghana.com/gold

Reed, Mark S. (2008). Stakeholder Participation for Environmental Management: A literature Review. Biological Conservation, 141 (10), 2417-2431. Retrieved (01.04.2014) from: http://www.sciencedirect.com/science/article/pii/S0006320708002693#

Revenue Watch Institute (2013). *The 2013 Resource Governance Index - Ghana.* Retrieved (25.04.2014) from: http://www.revenuewatch.org/sites/default/files/country_pdfs/ghanaRGI2013.pdf

Roe, Alan & Samuel, Jonathan (2007). Ghana Country Case Study – The challenge of mineral wealth: using resource endowments to foster sustainable development. *International Council on Mining and Metals.* Retrieved (28.05.2014) from: http://www.revenuewatch.org/training/resource_center/ghana-country-case-study-challenge-mineral-wealth-using-resource-endowments

Ross, Michael (2003). Natural Resources Curse: How Wealth Can Make You Poor. In Bannon, Ian & Collier, Paul (Ed.), *Natural Resources and Violent Conflict.* Washington D.C: The World Bank. Retrieved (25.10.13) from: http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/05/24/000012009_20040524154222/Rendered/PDF/282450Natural0resources0violent0conflict.pdf

Sarpong, Daniel B. & Dao, Xinshen (2007). Cost Implications of Agricultural Land Degradation in Ghana. International Food Policy Research Institute. Retrieved (11.03.2014) from: http://www.ifpri.org/publication/cost-implications-agricultural-land-degradation-ghana

Sautman, Barry and Hairong, Yan (2009). African Perspectives on China–Africa Links. *The China Quarterly*, 199, 728-759. Retrieved (26.04.2013) from: http://journals.cambridge.org/action/displayFulltext?type=1&fid=6166352&jid=CQY&volumeId=199&issueId=-1&aid=6166344&bodyId=&membershipNumber=&societyETOCSession=

Schueler, Vivian, Muemmerle, Tobias, Schröder (2011). Impacts of Surface Gold Mining and Land Use Systems in Western Ghana. *AMBIO,* 40, 528-539. Retrieved (25.05.2014) from: http://www.ncbi.nlm.nih.gov/pubmed/21848141

Schultz, Theodore W. (1961). Investment in Human Capital. *The American Economic Review,* 51 (1), 1-17. Retrieved (03.06.2014) from: http://www.jstor.org/stable/1818907

Shoujun, Cui (2013, 13.05). Special report: China's image crisis in Ghana. *China Dialogue*. Retrieved (14.11.13) from: https://www.chinadialogue.net/article/show/single/en/6005-Special-report-China-s-image-crisis-in-Ghana

Smith, Adam (1982). *The Wealth of Nations. London.* UK: Penguin Classis; New Ed edition.

Song, Sophie (2013, 15.05). A Modern Day Gold Rush – How People Of One County In China Are Making Millions In Ghana. *International Business Times*. Retrieved (01.05.2014) from: http://www.ibtimes.com/modern-day-gold-rush-how-people-one-county-china-are-making-millions-ghana-1260801

Sosuh, Margaret Mansa (2011). Border Security in Ghana: Challenges and Prospects. *Peace and Security*. Retrieved (26.03.2014) from: http://www.kaiptc.org/Publications/Occasional-Papers/Documents/Occasional-Paper-32-Margaret.aspx

Sutton, Rebecca (1999). The Policy Process: An Overview. *Overseas Development Institute*. Retrieved (05.11.2013) from: http://www.eldis.org/vfile/upload/1/document/0708/DOC7279.pdf

Tadesse, Ephrem, Ameck, G., Christensen, C., Masiko, P., Matlhakola, M., Shilaho, W., Smith, R. (2006). The People Shall Govern: A Research Report on Public Participation in the Policy Process. *Centre for the Study of Violence and Reconciliation, and Action for Conflict Transformation*. Retrieved (08.09.2014) from: http://www.csvr.org.za/docs/peacebuilding/people.pdf

Tawiah, Ohemeng (2012, 27.08). More Pregnant Women in Amansie West are HIV Positive. *Joy Online*. Retrieved (16.02.2014) from: http://edition.myjoyonline.com/pages/news/201207/91158.php

Tawiah, Ohemeng (2014, 25.01). Abandoned Galamsey pits kill 17- people in Amansie West District within 8-months. *Joy Online.* Retrieved (02.06.2014) from: http://www.myjoyonline.com/news/2014/January-25th/abandoned-galamsey-pits-kill-17-people-in-amansie-west-district-within-8-months.php

Taylor-Powell, Ellen and Renner, Marcus (2003). *Analyzing Qualitative Data.* (02.05.2013) from: http://www.learningstore.uwex.edu/pdf/g3658-12.pdf

Teschner, Benjamin, A. (2012). Small-Scale mining in Ghana: The Government and the galamsey. *Resources Policy,* 32 (3), 308-314. Retrieved (21.04.2014) from: http://www.sciencedirect.com/science/article/pii/S0301420712000074

Tetrem, Ash (2010, 16.09). School Children in Amansie West Engaging in *Galamsey. Ghana News Agency*. Retrieved (18.02.2014) from: http://ghananewsagency.org/education/school-children-in-amansie-west-engaging-in-*galamsey*-20442

Tetteh, Benjamin (2013, 16.08). Minerals Development Fund to be Developed to Track Mining Benefits to the Economy. *Joy Online.* Retrieved (25.05.2014) from: http://business.myjoyonline.com/pages/news/201308/111551.php

Todaro, Michael P. & Smith, Stephen C. (2011). *Economic Development*. England, Essex: Pearson Education Limited.

Today (2014). 'Anti-*galamsey*' war failing due to China's $3b loan to Ghana – Sec. Chief. *Today.* Retrieved (23.05.2014) from: http://www.todaygh.com/2014/05/05/anti-*galamsey*-war-failing-due-chinas-3b-loan-ghana-sec-chief/

Transparency International (2013a). *Corruption by Country: Ghana.* Retrieved (13.10.13) from: http://www.transparency.org/country#GHA

Transparency International (2013b). *Corruption by Country: China*. Retrieved (31.04.2014) from: http://www.transparency.org/country/#CHN

Transparency International (2013c). *Corruption by Country: Ghana – Global Corruption Barometer 2010/11.* Retrieved (21.05.2014) from: http://www.transparency.org/country#GHA_PublicOpinion

Transparency International (2013d). *Global Corruption Barometer 2013 – Ghana*. Retrieved (21.05.2014) from: http://www.transparency.org/gcb2013/country/?country=ghana

Tschakert, Petra (2008). Recognizing and nurturing artisanal mining as a viable livelihood. *Resource Policy*, 34 (1-2), 24-31. Retrieved (16.05.2014) from: http://www.sciencedirect.com/science/article/pii/S030142070800069X

Tschakert, Petra & Singha, Kamini (2007). Contaminated Identities: Mercury and marginalization in Ghana's artisinal mining sector. *Geoforum* 38, 1304-1321. Retrieved (09.11.13) from: http://www.communitymining.org/attachments/241_Mercury%20and%20marginalization%20Ghana.pdf?phpMyAdmin=cde87b62947d46938306c1d6ab7a0420

UN (n.d.a). *Environmental Guidelines for Mining Operations.* Retrieved (16.1013) from: http://commdev.org/files/814_file_UNEP_UNDESA_EnvGuidelines.pdf

UN (n.d.b). *A Report on Ghana's Mining Sector for the 18th Sessions of the UN Commission on Sustainable Development*. Retrieved (13.05.2014) from: http://www.un.org/esa/dsd/dsd_aofw_ni/ni_pdfs/NationalReports/ghana/Mining.pdf

UNDP (2013). *International Human Development Indicators – Ghana.* Retrieved (18.10.13) from: http://hdr.undp.org/en/countries/profiles/GHA

UNEP (2011). *Reducing Mercury Use in Artisinal Small-scale Gold Mining.* Retrieved (20.03.2014) from: http://www.unep.org/chemicalsandwaste/Portals/9/Mercury/Documents/ASGM/Techdoc/LAST%20VERSION%20UNEP_Technical_Document__DEC_31_E%5B1%5D.pdf

UNEP (2013). *Minamata Convention on Mercury.* Retrieved (06.05.2014) from: http://mercuryconvention.org/Portals/11/documents/conventionText/Minamata%20Convention%20on%20Mercury_e.pdf

UNEP (2014). *Minamata Convention on Mercury – Countries.* Retrieved (06.05.2014) from: http://mercuryconvention.org/Countries/tabid/3428/Default.aspx

UNEP (n.d). *Republic of Ghana.* Retrieved (13.10.2013) from: http://www.unep.org/pdf/PressReleases/Ghana_Africa_Atlas.pdf

Veiga, Marcello M., Maxsin, Peter A. & Lars Hylander D. (2006). Origin and consumption of mercury in small-scale gold mining. *Journal of Cleaner Production,* 14 (3-4). Retrieved (25.05.2014) from: http://www.sciencedirect.com/science/article/pii/S0959652605000752/pdfft?md5=bac58e64a10f4a65f267a01b7aeaf882&pid=1-s2.0-S0959652605000752-main.pdf

Watts, Michael (2004). Resource curse? governmentality, oil and power in the Niger Delta, Nigeria. *Geopolitics*, 9 (1), 50-80. Retrieved (08.11.13) from: http://www.tandfonline.com/doi/abs/10.1080/14650040412331307832

Wegner, Lucia (2012). *Cocoa Fact Sheet - Working Document*. Retrieved (31.03.2014) from: http://seasofchange.net/file/downloads/2012/04/05.04-SoC-cocoa-fact-sheet-final_cover1.pdf

Williams, Sherwood & McGrath, John H. (1976). Why People Own Guns. *Journal of Communication.* 26 (4). Retrieved (17.04.2014) from: http://onlinelibrary.wiley.com/doi/10.1111/j.1460-2466.1976.tb01931.x/pdf

Williams, Stephen (2012). Ghana Oil: A Crude Awakening. *New African*. Retrieved (25.05.14) from: http://www.newafricanmagazine.com/index.php?option=com_k2&view=item&id=305:ghana-oil-a-crude-awakening&Itemid=554

World Bank (1995). *Staff Appraisal Report, Republic of Ghana, Mining Sector Development and Environmental Project*. West Central Africa Department, Africa Region: World Bank, Industry and Energy Operations. Retrieved (25.05.2014) from: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1995/05/19/000009265_3961019101227/Rendered/INDEX/multi0page.txt

World Bank (2011). *What is Social Capital.* Retrieved (29.04.2013) from: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTTSOCIALCAPITAL/0,,contentMDK:20185164~menuPK:418217~pagePK:148956~piPK:216618~theSitePK:401015,00.html

World Bank (2013a). *Ghana Overview.* Retrieved (03.11.13) from: http://www.worldbank.org/en/country/ghana/overview

World Bank (2013b). *Ghana - Data.* Retrieved (03.11.13) from: http://data.worldbank.org/country/ghana

World Bank (2013c). *Arable Land (% of land area)*. Retrieved (03.11.13) from: http://data.worldbank.org/indicator/AG.LND.ARBL.ZS

World Bank (2014a). *Poverty & Equity – China.* Retrieved (28.05.2014) from: http://povertydata.worldbank.org/poverty/country/CHN

World Bank (2014b). *Net ODA received per capita (current US$).* Retrieved (14.03.2014) from: http://data.worldbank.org/indicator/DT.ODA.ODAT.PC.ZS/countries/ZG-GH?display=graph

The World Bank Group (2013). *Worldwide Governance Indicators.* Retrieved (21.05.2014) from: http://info.worldbank.org/governance/wgi/index.aspx#reports

World Gold Council (2013). *Ghana.* Retrieved (24.03.2014) from: http://www.goldfacts.org/en/economic_impact/countries/ghana/

World Health Organization (WHO) (2007). *Preventing Disease Through Healthy Environments - Exposure to Mercury: A Major Public Health Concern*. Retrieved (20.03.3014) from: http://www.who.int/ipcs/features/mercury.pdf

World Meteorological Organization (2006). Climate and Land Degradation. WMO, 989. Retrieved (25.02.2014) from: https://www.wmo.int/pages/themes/wmoprod/documents/WMO989E.pdf

Yao, Shuntian (2002). Privilege and Corruption – The Problems of China's Socialist Market Economy. *American Journal of Economics and Sociology*, 61 (1), 279-299. Retrieved (18.05.2014) from: http://onlinelibrary.wiley.com/doi/10.1111/1536-7150.00160/pdf

Youth Employment Inventory (n.d). *National Youth Employment Programme (NYEP)*. Retrieved (16.05.2014) from: http://www.youth-employment-inventory.org/inventory/view/404/

Zainal, Zaidah (2008). Case study as a research method. *Journal Kemamusiaan*, 9, 1-6. Retrieved (29.04.2013) from: http://www.eprints.utm.my/8221/1/ZZainal2007-Case_study_as_a_Research.pdf

Appendices

Appendix 1

PMMC's Gold Exports Between 1989 and 2011.

PMMC Gold Exports 1989 - 2011			
YEAR	OUNCES(000)	VALUE ($ MILLION)	AV.PRIZE/OZ($)
1989	9,27	3,73	402,37
1990	17,23	6,26	363,32
1991	15,6	5,33	341,67
1992	17,3	6,15	355,49
1993	35,14	12,65	359,99
1994	55,23	21,29	385,48
1995	55,54	21,33	384,05
1996	51,32	20,29	395,36
1997	58,86	20,1	341,49
1998	59,72	17,1	286,34
1999	74,49	20,2	271,18
2000	62	17,31	279,19
2001	50,87	12,64	248,48
2002	40,17	12,53	311,92
2003	43,87	15,74	358,43
2004	17,59	6,24	354,58
2005	29,74	13,13	509,19
2006	23,49	14,27	607,49
2007	18,6	11,71	629,61
2008	38,12	32,87	861,79
2009	76,88	75,48	981,78
2010	384,51	463.42	1205,22
2011	254,05	393,91	1550,5

(PMMC, 2012)

Appendix 2

Overview of respondents

	Age	Gender	Occupation	Nr. Children	Household	Avr. M	Level of Ed.
Respondent		M/F			size	Income	
Chief 1	-	M	FARMER	-	-	-	-
Chief 2	-	M	FARMER	-	-	-	-
Community Member 1	32	M	FARMER	3	7	N.A	HIGH SCHOOL
Community Member 2	50	M	FARMER	5	7	N.A	HIGH SCHOOL
Community Member 3	35	M	MINER	7	15	5000	HIGH SCHOOL
Farmer 1	51	M	FARMER	6	8	N.A	HIGH SCHOOL
Farmer 2	40	F	FARMER	4	7	N.A	JR. HIGH SCHOOL
Farmer 3	55	F	FARMER	3	10	N.A	HIGH SCHOOL
Farmer 4	54	M	FAMRER	9	15	650	HIGH SCHOOL
Galamsey 1 Chinese Site	27	M	MINER	0	2	800	-
Galamsey 2 Chinese Site	30	M	MINER	0	2	1500	-
Galamsey 3 Chinese Site	22	M	MINER			N.A	-
Galamsey 4 Chinese Site	25	M	MINER	0	8	1200	C6 PRIMARY
Galamsey 1	36	M	MINER	2	3	1080	BIBLE SCHOOL
Galamsey 2	18	F	MINER	1	12	1560	JR. HIGH SCHOOL
Galamsey 3		M	MINER	-	-	1440	-
DCE	-	M	-	-	-	-	-
EPA Officer	-	M	-	-	-	-	-
Pharmasist	36	M	-	-	-	-	-
District Police Director	-	M	-	-	-	-	-

Appendix 3

Interview guide local *galamsey*

Demographics/statistics

Code

- Day:
- Length of the interview:
- Place of the interview:
- Community she/he is coming from:
- Where the community member is living:
- Age:
- Occupation:
- Level of education:
- Marital status:
- Nr. of children:
- Religion:
- Ethnic group:
- Number of people in household?

In what ways have Chinese small-scale miners contributed to environmental, social and socio-economic impacts on the local community?

1. How would you describe the local community before the Chinese *galamsey* arrived?
2. In your view, what is illegal mining/*galamsey*
   a) Do you consider yourself a legal miner? If yes, why? If no, why not?
3. Do you think there are any negative aspects of practicing small-scale mining?
4. What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
5. What social impacts do you think the Chinese has on the local community?
   b) What social impacts do you think the Chinese illegal miners have on the local community?

Prompt: How does it affect local's view on Chinese's wider presence in the Ashanti region?

6. What economic impacts do you think the Chinese has on your household?
   b) What economic impacts do you think the Chinese illegal miners have on your household?
   c) Has your income changed much the last five years?
   d) Have the portion of income from farming versus mining changed much during the last ten years? Why do think?

Prompt: How have local miner's income changed? Job opportunities?

What have local authorities done to deal with the problem?

1. Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
2. Are you a registered miner? If no, why not?
3. Have you gotten any assistance/advice (from government) to alternative activities to mining?

Interview guide farmers/community members

Demographics/statistics
Code
- Day:
- Length of the interview:
- Place of the interview:
- Community she/he is coming from:
- Where the community member is living:
- Age:
- Occupation:
- Level of education:
- Marital status:
- Nr. of children:
- Religion:
- Ethnic group:
- Number of people in household?

In what ways have Chinese small-scale miners contributed to environmental, social and socio-economic impacts on the local community?

1. What do you think about small-scale mining? Why do you not practice it?
2. How would you describe the local community before the Chinese *galamsey* arrived?
3. In your view, what is illegal mining/*galamsey*?
4. What effects do you think Chinese illegal mining activities have on the local environment such as water and air quality, and your agricultural activity?
5. What social impacts do you think the Chinese has on the local community?
   b) What social impacts do you think the Chinese illegal miners have on your household?

Prompt: How does it affect local's view on Chinese's wider presence in the Ashanti region?

6. What economic impacts do you think the Chinese has on your household?
   b) What economic impacts do you think the Chinese illegal miners have on your household?
   c) Has your income changed much the last five years?

What have local authorities done to deal with the problem?

1. Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?

Interview guide DCE

Demographics/statistics
Code
- Day:
- Length of the interview:
- Place of the interview:
- Community she/he is coming from:
- Religion:
- Ethnic group:

In what ways have Chinese small-scale miners contributed to environmental, social and socio-economic impacts on the local community?

1. How would you describe the local community before the Chinese *galamsey* arrived?
2. In your view, what is illegal mining/*galamsey*
3. How many Chinese illegal miners are there in this community?
4. What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
    b) Are locals well informed about the health and environmental effects of mining?
5. What social impacts do you think the Chinese has on the local community?
    b) What social impacts do you think the Chinese illegal miners have on the local community?
    c) How many incidents of hostility and conflict between Chinese and locals are known? What caused them?

Prompt: How does it affect local's view on Chinese's wider presence in the Ashanti region?

6. What economic impacts do you think the Chinese has on the local community?
    b) What economic impacts do you think the Chinese illegal miners have on the local community?

Prompt: How have local miner's income changed?

What have local authorities done to deal with the problem?

1. What initiatives have been done in order to reduce the amount of Chinese *galamsey*?
2. Do you think the current mining policies are working well? If yes, why? If no, why not?

Prompt: Implementation strategies.

    a) What forms of accountability and participation is/has been present?

3. Why do you think so many local miners are still unregistered and unwilling to register
4. I have understood that the 1989 legalization of mercury was done to cope with poverty, and give the grass-root a source of income. Do you have any thoughts on whether or not it has served its purpose?

Interview guide for Chiefs

Demographics/statistics
Code
- Day:
- Length of the interview:
- Place of the interview:
- Community she/he is coming from:
- Religion:
- Ethnic group:

In what ways have Chinese small-scale miners contributed to environmental, social and socio-economic impacts on the local community?

1. How would you describe the local community before the Chinese *galamsey* arrived?
2. In your view, what is illegal mining/*galamsey*?
3. How many Chinese small-scale miners are there in this community?
4. What effects do you think Chinese small-scale mining activities have on the local environment (and agricultural land, water, air quality)?
    a) Are locals well informed about the health and environmental effects of mining?
5. What social impacts do you think the Chinese (in general) has on the local community?
    b) What social impacts do you think the Chinese small-scale miners have on the local community?
    c) How do you think they got permission to mine on the land?

Prompt: How does it affect local's views on Chinese's wider presence in the Ashanti region?

6. What economic impacts do you think the Chinese has on the local community?
    b) What economic impacts do you think the Chinese illegal miners have on the local community?

Prompt: How have local miner's income changed?

What have local authorities done to deal with the problem?

1. What are the local traditional policies with regards to land and environment?

    b) how do they differ from the governmental policies?a

Appendix 4

Semi-structured interviews

I= Interviewer

R= Respondent

15.01.2014

Galamesey 1
Demographics/statistics
Code
Day: 15.01.2014
Length of the interview: 18:52
Place of the interview: Manso Emmem
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Age: 36
Gender: Male
Occupation: Miner
Level of education: Bible School/ Arabic School
Marital status: Married
Nr. of children: 2 (5 and 6 years)
Ethnic group: Niger
Number of people in household: 3
Level of income pr. month: No reply.

I: Are you in Ghana because of Mining?
R: No, I was selling things, but the buyer invited me to come work with him.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the *galamsey*, we were farmers. But before the Chinese people arrived, some of the local people were doing the *galamsey* work, but it is different from what we are doing now.

I: How long have you been in Ghana?
R: Eight years.

I: Comparing the selling you did before, and the *galamsey* work you do now. Which is best?
R: The selling was better, because then I was in control of the money. Whatever comes out of it would belong to me. But now, somebody pays me. The buyer of our gold, pays the amount he chooses, not at a fixed rate. It can vary a lot, sometimes 50C and some days 40C a day. Sometimes the buyer also decides not to pay the day he gets the gold.

I: In your view, what is illegal mining/*galamsey*
R: *Galamsey* is a person who is looking for gold.

I: Do you know a big company who do mining?

R: No I don't know any company.

I: do you consider yourself a legal miner? If yes, why? If no, why not?
R: Yes, I see myself as a *galamsey*. Because we are doing gold work. Everybody who looks for gold, we call a *galamsey*.

I: If all those who look for gold, are *galamsey*, why do the police arrest some, but not others?
R: Maybe the buyers of those miners don't have a paper, and thus the police arrests the miners.

I: If we were policemen and came to this site, would you run or stay here?
R: No, we will get the buyer to show them the papers. If he don't have the paper, they will arrest him, not us.

I: After they have taken the gold, can you plant anything in the same area?
R: No, because the farmer has already sold the land. So nobody will ever come here to plant anything again.

I: If you give the land back to the farmer, can the farmer then plant something?
R: If they recover all the holes, then farmer can work the land again.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: The water is spoiled, the farmland is also spoiled. They Chinese have already cut all the coco. No matter what is on the land that is sold to the Chinese, they will destroy what is on it.

I: Where does the water you use at this site come from?
R: It's they buyer who hired somebody to dig a hole for us.

I: What do the Chinese miners do for the local community?
R: I don't know, but I haven't heard of any cases.

I: Does the buyer try to support the community, with water or other things?
R: No, I don't know about anything like that.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: They are far from us, so they have no social impact on us.

I: Has your income changed much the last five years?
R: Since he is not selling again, and now he's salary is not fixed. The buyer pays me whatever he chooses, which is not good. So my income is decreasing.

I: Those who are working the machines, what is their salary like?
R: They earn much more than me by the end of the month.

I: Have the portion of income from farming versus mining changed much during the last ten years? Why do think?
R: I don't know, because they have already sold their land. What they did with the money, I don't know. If they invested or spent them is hard to say.

I: Are you aware that the Chinese miners are working in Ghana?
R: Yes, I also know some places where they are working around here.

I: Does you buyer have a license/document?
R: I don't know.

I: If the soldiers come around now, would you stand still?
R: No, I would run away. They will not ask any questions, just start beating us.

I: Are you a registered miner? If no, why not?
R: No.

I: Have you gotten any assistance/advice (from government) to alternative activities to mining?
R: No, nobody has come here and done that.

I: Illegal mining, is it going to help the country in general?
R: No, it won't help us. The reason it won't help us, is that when they finish the land, they don't cover the land, which makes it unsuitable for use in the future. Also, the water system, the water we use in the community is destroyed.

I: If the government give you the power to stop the *galamsey*, are you going to do it?
R: Since I'm coming from Niger, I'm not gonna have that power. Since I'm working with other people here, I can't answer. If I give you a straight answer, I might get sacked. But I do know that *galamsey* work is not good.

***Galamsey* 2**
Day: 15.01.2014
Length of the interview: 07:05
Place of the interview: Manso Nkwanta
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Age: 18
Gender: Female
Occupation: Miner
Level of education: Junior High School
Marital status: Married
Nr. of children: 1 (1 year and 6 months)
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 12
How long in the work: 1 year. Not working before that.
Level of income pr. month: I'm not working for them, I just come and pick some of the sand, and wash it at home. Whatever I get, it belongs to me. Sometimes 60 GHS daily, other times 70 GHS.

I: What do you do with the money?
R: I use some and save some. The baby is even sick.

I: In your view, what is illegal mining/*galamsey*

R: I have never heard about *galamsey*.

I: What do you call what you are practicing now?
R: *laughing*. What I am doing is called galla.

I: Is it good if everyone comes to do the *galamsey* work?
R: No it's no good.

I: Why?
R: It's very tedious work, it's not easy. Sometimes, we have to go inside the pit to get water to wash the sand.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: They were all farmers. They planted coco.

I: How do the miners get the land?
R: It's the farmers who sold to them.

I: What effects do you think Chinese illegal mining activities have on the local environment such as water and air quality?
R: I'm not aware the impact it has on air, but I know that it is bad for the water, and that it destroys farmland.

I: What is your source of water for living and cooking food?
R: We have a bore hole now.

I: Has your income changed much the last five years?
R: We are ok now. We earn more than we did five years ago.

I: Are you aware of any policies regarding the Chinese illegal miners?
R: No.

***Galamsey* 3**
Day: 15.01.2014
Length of the interview: 07:37
Place of the interview: Manso Nkwanta
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Gender: Man
Occupation: Miner

I: When did you start using mercury?
R: We use it when we finish washing.

I: At what time do you use it?
R: We use it in the evening. We just call mercury "Med".

I: Why are you not using mercury in the afternoon?

R: The reason is that we need to wash everything first, before we can use the "med", that is why we normally use it in the night. The water separate the sand from the gold. The water will take all the sand and mud away, and the gold will be stuck in the mat.

I: How is your salary structure? Is it fixed?
R: It's not fixed, when we finish washing, the buyer will buy the gold. The amount we get, which often varies, is shared among us.

I: How much is it normal to get?
R: The ladies get around 30GHS a day. Those working with the machines get around 60 GHS a day. It depends on the amount of gold we get every day.

I: Working at the *galamsey* site and farming, what is the best?
R: Those who come from far away, they came in for farming. But now they have stopped and started *galamsey*. For now, if someone asks us to work in a farm, we won't go, we will stay and work here.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: It depends, for example when it comes to plantain, the prices has increased from GHS 2 to around 5-7 GHS. This is because less people are farming, which makes less plantain available. Also because the Chinese pay anything you ask for this. The raining season is good, because then the prices go down. Another reason that the prices raise, is that many people have travelled here to work in the *galamsey*. Because of that, the supply is too low, and the prices go up, so we have to buy things outside, in Kumasi.

I: What effects do you think Chinese illegal mining activities have on the local environment such as water and air quality?
R: Now, all the water has turned red. They have destroyed it, so that we cannot use it for anything. I'm not aware of any effect on the air.

I: You are aware that the Chinese have destroyed the water and farmland, don't you think that what you do will have an effect on us?
R: Yes it affects us, but there are no other jobs for the youth besides farming. Before the *galamsey* arrived, you could see five persons of a family in the same bedroom. But now, all the youth have their own bedrooms. So in one side, the *galamsey* helps us, but in another way it is destroying. Before the *galamsey*, we used to drink the water around this area, but now we have to buy the water from the plastic bags.

Chief 1
Day: 15.01.2014
Length of the interview: 17:09
Place of the interview: Manso Kwabenaso
Community she/he is coming from: Manso Kwabenaso
Where the community member is living: Manso Kwabenaso
Occupation: Chief
Religion: Ashanti
Ethnic group: Ashanti. Because of the *galamsey*, a lot of people from other tribes are now also found here.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the *galamsey* arrived, the main job the community did was farming. And it's not only them who have been doing it, their forefathers were also farmers. But now, because of the *galamsey* work, the youth don't want to go back to farming again. Their interest is not in the farming work. The reason that the youth want to go into *galamsey* is that they only think about money they can get fast and now, they don't think about the future.

I: In your view, what is illegal mining/*galamsey*
R: *Galamsey* is the person who does mining without having a license, and because of that they don't pay anything to the government. They think about their own family, not about anyone else.

I: How many Chinese small scale miners are there in this community?
R: There were, let's say, three groups here, but because something happened over there, so the government told the Chinese to leave the place. At this time, there are no Chinese miners in this community, they just come here and leave, they don't stay here and they don't work here.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: I don't know if they have papers or not, but after they have taken the gold, they don't cover the land. So the *galamsey* is destroying our farmland. It also destroys our water, even the chemicals they use have polluted it. Even though the water is not dirty, it is still polluted. We don't feel the destruction now, but I know that in the near future, the locals will see how the Chinese miners have destroyed everything.

I: Are locals informed about the health implications of mining?
R: Nobody has informed them, but what they are doing over there, they shouldn't wait for somebody to come and educated them.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: When the Chinese people were around, the problem we were facing was that the Chinese would never come to you and tell you that they want to do anything for the community. We have to go them ourselves and ask them if they can contribute. Sometimes, it becomes an argument between the leaders and the Chinese people. If we ask the Chinese if they can make a borehole for us, they refuse because of what they have to pay to do it. One problem is that, sometimes it is very difficult to talk to a Chinese directly, since we never see them. We have to talk to a local who are leading them, they will inform the Chinese people what the community needs. This makes it a very long process, so if we need something from them, we have to wait weeks, maybe months before we get an answer.

I: How do you think they got permission to mine on the land?
R: The Chinese people don't have a license, they cannot get it. So it's the local people who gets a license, then they invite the Chinese people. The reason the local people do this is, one; knowledge, it's Chinese who has knowledge about how to do the work. Two; because of the machines, they have excavators. The Chinese pay the local people to get license for them, and then hires locals to work there. They do it in percentages. The Chinese pay maybe 20-30% of all income of the mining to the person who gets them the license.

I: What economic impacts do you think the Chinese illegal miners have on your household?

R: Well, how they get the land. When they come to the community, they go straight to the "gold lands", where they think it might be gold. After siting the location, they ask the farm owners if they want to sell their land. They discuss with them to find a price. The one mistake the farmer always does is; after discussing the amount they don't discuss filling the land after the gold is gone. They only think about money, they don't care about what happens to the land afterwards. The illegal miners, since the amount they pay to the farmers, is very huge, some use it to build another room for their family, and some use their money to support the education of their children. The farmers, they don't think about the future, if you sell your land now to buy a room, what happens in the future?

I: What are the local traditional policies with regards to land and environment?
R: Gold, timer, it doesn't belong to the chiefs, it belongs to the government. So it's the government who is to give them rules and policies. The Chiefs don't have any policies. What the traditional people can do, is that they tell the miners who come that after taking out the gold, they should refill the land for them. But the main policies are supposed to come from the government and the EPA people. The chiefs should have rules for those who come and mine for gold, because the land belongs to the Chief, only the gold belongs to the government.

I: Did you support the *galamsey* work?
R: No, I would never support the *galamsey* work. First of all, it is a undisciplined life, it means that those working at the sites don't respect anybody. And they dropped out of school to go to *galamsey*. Even those who are still in school, go straight to the *galamsey* place after the school is finished. They don't read or do their homework. Because of that, a lot of teenage pregnancy has increased. So girls aged 14, 15 and 18 all give birth now. One example is when I went to hospital close by. I then saw a 14 year old girl coming to the hospital with her baby. I went over to her and asking if the baby belongs to her mother. She said "no", it is my child. The father is a junior high school boy. The *galamsey* work, for now, those who are working at the sites have money in their pockets now. But still, because of all these reasons I do not support *galamsey* work. I have visited the hospitals, discussing issues with nurses, and what they say is that the HIV virus is in our community now, because of a lot of people coming inside. The strangers who come and work over there, will never come there with their own name. They come with a different name. So when they finish and disappear, it will be very difficult finding that person again. Currently I'm begging the government to do something about the *galamsey* work in the Manso district. Because now, the *galamsey* has money, so it is wise to do something about it now, rather than later, when they have less money. The Chinese people, or those who are doing the *galamsey*, they might pay tax/money to the government in order to be allowed to do it. Sometimes, the local people who are leading the Chinese people, when they come to palace, they give one shnapps and the amount of around 100 GHS. After paying this, he will never see them again, so it is very difficult to find them later and tell them to fill the land. If they leave the land uncovered, you can't go and arrest them.

Chief 2
Day: 15.01.2014
Length of the interview: 10:50
Place of the interview: Manso Koninase
Community she/he is coming from: Manso Koninase
Where the community member is living: Manso Koninase

I: How would you describe the local community before the Chinese *galamsey* arrived?

R: They were doing farming, later on the youth started to do the *galamsey* as well. This was before the Chinese came in.

I: In your view, what is illegal mining/*galamsey*
R: *Galamsey* means gather and sell.

I: How many Chinese *galamsey* do you have here?
R: We used to have three Chinese just outside the community, but they are not here anymore. There were two groups outside the community, so there might have been more than those three, but that I don't know.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: Since they use mercury at the site, the mercury has destroyed the water, and it's also dirty. Those who are working over there are working close to the river site. They are not close to the farmland, that is safe now.

I: Are locals well informed about the health effects of mining?
R: They have not informed them, but those who are doing the *galamsey* work, since they have worked for a very long time, some are aware of the consequences of doing *galamsey* work. But those who are not doing the work, don't know anything at all about it.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: Since the Chinese *galamsey* arrived in our community, they have destroyed everything. On example is our water. Even the local *galamsey* now find it very difficult to find clean water to wash their sand. We used to have a river around the community, but the Chinese has destroyed it, so we cannot use that water anymore. For now, our source of water is two boreholes the government provided us. We also got another borehole from a company. So we have three bore holes.

I: How do you think they got permission to mine on the land?
R: I know that you are coming from Accra, so I'm supposed to ask you how they got the permission. It is in Accra one gets these permissions.

I: Did any of those who came here to mine, show you a license?
R: No I have asked them, but nobody has provided any license.

I: If they don't provide the license, why do the chiefs allow them to work?
R: When they come to you, they will tell you that they have paid money to the regional chief. So they lie, and there is no possibility of checking with the regional chief it is ok.

I: Why can't you go speak with the regional chief?
R: If you go and ask him, it will be like I'm challenging him.

I: Does the main chief give the local chiefs something?
R: No.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: The youth don't go to farming anymore. They have all shifted to *galamsey* work. Those who are doing the cocoa are few. In my family, nobody is helping me in the farm work.

I: Why is it like this?
R: They helped me farming just after I became a Chief, but then they quit, and haven't helped since.

I: What are the local traditional policies with regards to land and environment?
R: The main chief has ordered the local chiefs that they should not allow anyone to work at their *galamsey* sites, without coming to them. But one problem is, that many *galamsey* don't come to the chief, they just go straight to work. So it would be very difficult to have policies regarding this.

I: Did you support the *galamsey* work?
R: I have never worked at a *galamsey* site before, but if the government said that those who has papers can do the *galamsey* work, I cannot stop them. For me, I don't support those who are doing the *galamsey* work. The local chiefs have had many meetings with the district officer, that they should come and stop the *galamsey* over here.

I: What is the reason that it is so hard to stop the youth in doing *galamsey* work?
R: *Galamsey* is something like, whenever you have tasted it, it is very hard for you to stop. Also, if they stop doing the *galamsey* there is no job for them.

16.01.2014

Community Member 1
Day: 16.01.2014
Length of the interview: 13:51
Place of the interview:
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Age: 32 years
Occupation: Farmer
Level of education: High School
Marital status: Married
Nr. of children: 3
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 7
Level of income pr. month:

I: What do you think about small-scale mining? Why do you not practice it?
R: Small scale mining, at times they used to call it *galamsey*. What they do is that they start with one big hole, when they finish in let's say 6-7 months, and take all the gold, they make another pit. The distances between the pits are usually 5 feet. After we take out the sand, we put it in a big bowl where we put some of the sand, and add water, then try to wash the gold from the sand. I used to be a small-scale miner as well, but now I have stopped. The work was too much for me.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before, the community was not busy as now. And there were the same people in the community, almost never any new people. The business was very scarse, there was only one

store around, before the *galamsey* arrived. Before the *galamsey*, everybody wanted to do farming, because without it there was no income. Even all the youth wanted to go into farming.

I: In your view, what is illegal mining/*galamsey*
R: Illegal mining is a group of people trying to look for gold, and we know that *galamsey* are people with no purpose in life.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: The *galamsey* for now, is not helping the community. It helps in some way, and in other ways it is killing us. Before the *galamsey* arrived, we had a small river around our village. When the water pipes was not working we used to go there to fetch our water. But now, the Chinese *galamsey* has destroyed the water. They destroyed our land and coco and our plantain. After taking out the gold, they have destroyed the land. We cannot plant anything there again. So I can say for now that the Chinese illegal mining activity as has not helped us. Destroyed everything.

I: What social impacts do you think the Chinese has on the local community?
R: When the Chinese visit local's families, the Chinese give them money. I also have one of the Chinese as a friend.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: After they have bought the land from our parents, our parents use these money to build on their house with another room for instance. Then the money are gone, and the parents starts begging people for money as they have no income. The locals who are working at the *galamsey* site, sometimes they get 50-60 cedi daily.

I: Has your income changed much the last five years?
R: Yes, it has changed during these five years. When my parents sold the land to the Chinese for GHS 5000, they don't get any money from anywhere. Now, they have already used it all. Before they sold the land, they used to plant beans and garden eggs they got money every weekend. I think farming is better than selling your land to a Chinese *galamsey*.

I: Has many people in the community sold their land?
R: Yes, I know some of them. Especially those who had land around the river has sold it. Because of that, things are very difficult for them. Prices has increased much, plantain used to cost GHS 2, and now it costs 5 GHS.

I: How are the lives of the locals who now do *galamsey*?
R: They are complaining about doing it, because they were getting 20-50 GHS daily, but now they don't get the same. We also don't have big machines to use, like the Chinese have got.

What have local authorities done to deal with the problem?
I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: No. The Chinese will not come directly to buy the land, local peoples will come and buy it for them.

I: How many blades of gold do you as a group usually get every day?

R: 50 blades a day. We usually sell 1 blade for 50 GHS. The Chinese *galamsey* has not helped us now. They have destroyed our land, water and our farmland

I: The Chinese does not have any license?
R: No, no. That is the reason why they don't cover the land after having used it for gold digging.

Community Member 2
Day: 16.01.2014
Length of the interview: 14:13
Place of the interview: Manso Nkwanta
Community she/he is coming from: Manso Nkwanta
Where the community member is living:Manso Nkwanta
Age: 50 years
Occupation: Farmer
Level of education: High School
Marital status: Married
Nr. of children: 5
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 7
Level of income pr. month:

I: What do you think about small-scale mining?
R: Wait, let me ask you this; is it the president who sent you?

I: No, but the DCE is aware that we are doing these interview. Why do you ask that?
R: The reason why I'm asking you is no one from the parliament is helping our community. What we are doing here, or everything the community need, we sit down and plan, and take money from each person and do it. We have a committee here who go around and collect money from the community members. We have a bridge here, it's the locals who are doing the *galamsey* who paid money to build that bridge. The previous DCE had brought some people to collect money from the community members, but we didn't pay, we sacked them. Then we told them that we manage to do things by ourselves here. We are not going to pay them anything. We don't know if the current DCE is going to support our needs.

I: I'm not working with the DCE, but what I know from this man is that he is very good. So you should write to him and inform about your needs. The DCE is even just now going out himself to stop the *galamsey*.
R: Ok, I'm ready for the interview.

I: What do you think about small-scale mining?
R: In our community, there is no small-scale mining.

I: Had you heard anything about small-scale mining?
R: Yes, but I don't know how they operate.

I: How would you describe the local community before the Chinese *galamsey* arrived?

R: Before the *galamsey* arrived, the community was very calm. And now, those who are doing the *galamsey*, are using their money to build houses for their families. They also have stores where they sell things. If the government want to stop the *galamsey*, we would never support them in that, because of the benefits the *galamsey* has had for us.

I: In your view, what is illegal mining/*galamsey*
R: They buy their land from families and if they have the money, they would hire machines to come and dig. After the work, you calculate your expenses including hire of workers and machines, then you sell the gold and pay these expenses. We know that those who do *galamsey* don't have any license.

I: What effects do you think Chinese illegal mining activities have on the local environment?
R: I'm aware that the *galamsey* is helping us, but in other ways it is killing us too. But we can't stop the *galamsey*, because without it there is no job for us. When you go to somebody's house, you can see that it is much nicer than before the *galamsey*. What I would suggest to those doing the galmsey, is that they should cover the land after they have worked it. I'm aware that the *galamsey* also has destroyed our water.

I: What do you know about the land and the farming?
R: Most of the families has two or three lands, so when they sell one to the *galamsey*, they use the other one to plant things. So they have a separate land they can use for farming.

I: Do you have rivers around the community?
R: Yes, we had three, but now there is only one which we can use. The destroyed ones are called Subin and Arotewa. This is due to the *galamsey*.

I: What social impacts do you think the Chinese *galamsey* has on the local community?
R: The Chinese don't come here to live; they just work here, and stay outside the community. They should have come and stayed here, so that we could have told them what we need, so that they also could support us as the local *galamsey* does. Since they live outside it is very difficult to talk to them. Some Chinese even live in the bush where they work, and never come to town. So I don't support that the Chinese do the *galamsey*, since they do not benefit us.

I: So, how did the Chinese get visas to come and work here?
R: It is our leaders' who invited the Chinese people to come and work in our country. They didn't ask what kind of work they were going to do.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: After our parents sold the land to Chinese people, some saved their money at the local micro-finance institution, and one issue is that these banks work 6-7 months before they are out of business. So suddenly the money are gone. This happened to my parents. Because of that, some of the farmers don't have money now.

I: Besides farming, what do people here do?
R: *Galamsey*. There is only farming and *galamsey*.

I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: I don't know anything about that.

I: Do you support the government to stop the *galamsey* here?
R: No, but I support them in sacking the Chinese people. So only the local people would do the *galamsey*. If the Chinese people get they gold, they will send the gold to their country without paying any taxes. When local find gold, they locally, so that the money will have some income from it.

I: Are the Chinese still around here?
R: Some are gone, but some are still here.

I: What do you think is the solution to the problem?
R: Only the government can do anything about it, because they are ones who give them the opportunity to come here. In Ghana, there are few jobs now, so if you stop all the *galamsey*, there is nothing to do. The reason why people start with *galamsey*, is that when they finish school, there is no work to get besides this. If the government stop the local people, most of the boys who work with it have guns, so they will start doing armed robbery. The government should create jobs for the youth, so that they have alternatives.

Community Member 3
Day: 16.01.2014
Length of the interview: 16:45
Place of the interview: Manso Nkwanta
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Age: 35
Gender: Male
Occupation: Miner
Level of education: Level 4 (old system)
Marital status: Married
Nr. of children: 7
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 15
Level of income pr. month: The income is not fixed, so it depends. It can be around GHS 5000 a month.

I: In your view, what is Chinese *galamsey*?
R: Before they can start at the site, they go and buy the land from the farmers. After the land is bought, they rent the excavators, and the amount they sometimes pay to the owners is GHS 1500 for some days, plus fuel. The excavator will work for 3-4 days, before we will start washing. Because of the amount they paid to the excavator owners, they have to work 3-4 days before we can start washing. They then move to another location. So they dig constantly for the period they have rented it.

I: To you, what is small-scale mining?
R: The small-scale miners is the people who don't have license, that is why we call them small-scale.

I: What is the reason that people don't want to register their company before they come and work?
R: The amount of money they charge over there is very high, so they cannot pay it. Also, it takes a long time, lets say one week before you get your license. When you have the license, you need a sign board, an office, so it takes a lot of time to do it.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: Wherever the Chinese people worked over there, when they finished taking the gold, they don't cover anything. And they have destroyed our water which we used to cook and make food.

I: What social impacts do you think the Chinese in general has on the local community?
R: A lot of people like the Chinese. Because if you lead or help them, they will pay you. One of the problems though, is that they don't employ a lot of people. The work that actually need 10 people to do, they would employ only 4.

I: What social impacts do you think the Chinese illegal has on the local community?
R: When the Chinese people come to the local communities, they don't talk to you unless you are working with them. The Chinese illegal mining has changed our community, because they paid money for a road construction over there. Even the bridge over there, was contributed by the local miners. There's even another bridge we are working on now. So when we have enough money we will complete it. When we go to the districts offices and say what we need, they don't mind us. Those who are working at the *galamsey* now have their own rooms. But before, they were living in the same room as their parents. So in this way the *galamsey* has helped them a lot.

I: What about the community? Those who are not doing the *galamsey* work?
R: Half of the community people are doing the *galamsey* work. Because of them, there are no people complaining about money. Even those who do not work in *galamsey*, have one in their family who does, which supports them.

I: What economic impacts do you think the Chinese in general has on your household?
R: No, I don't have any Chinese friends, so no Chinese has helped me in the household.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: They haven't helped us at all, with any economic support.

I: Has your income changed much the last five years?
R: Before the *galamsey* work, I was a farmer, so when the *galamsey* arrived in our community, I stopped the farming work and joined the *galamsey* people. So for now, there's a big difference between the last five years. For now, I have my own building.

I: How have the local farmer's income changed do you think?
R: Before the *galamsey*, the farmers sometimes got GHS 1000 each month, but now they have sold their land for up to GHS 20 000.

I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?

R: The one policy I think they should give to the Chinese people, is that they should tell them to stay in our community, not in the bush. Because, whenever they go to the bush, and we go there, they would think that you are coming to steal from them. If you don't take caer, they will shoot you.

Farmer 1
Day: 16.01.2014
Length of the interview: 06:40
Place of the interview: Manso Abore
Community she/he is coming from: Manso Abore
Where the community member is living: Manso Abore
Gender: Male
Age: 51
Occupation: Farmer
Level of education: Level 4 (similar to old system of High School)
Marital status: Married
Nr. of children: 6
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 8
Level of income pr. month:

I: What do you think about small-scale mining? Why do you not practice it?
R: It's the people who work in the site looking for gold, I think it's the people who don't go deep, they just work in the surface. It's very hard work, and I'm not strong enough to do that work, therefore I concentrate on the farming.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the *galamsey* arrived, the community was very calm. There was no noise, but now, a lot of people have come here to do *galamsey*. So things have changed. Even, the youth, they no longer respect anybody, because they now have their own money.

I: In your view, what is illegal mining/*galamsey*
R: It's the people who don't have any papers but still work for gold. These are called *galamsey* or galla.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: Before the *galamsey*, when the farmer was going to his farm, he brought an empty bottle, because he knows that he could fetch water from the river on the way. But now the people of the community are crying for water, because the *galamsey* have destroyed it. Before the *galamsey* it was also not normal to see people littering or throwing garbage. But now, people just throw things outside, not thinking about the environment.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: The Chinese people don't visit us, they don't come to our house. They don't know our language, so it is very difficult to communicate with them. Since they don't even come directly to buy the land, but gets locals to do it for them, we don't see them much. When they come, they never stay in our community, but stay at the *galamsey* site.

I: What economic impacts do you think the Chinese in general has on your household?
R: The Chinese people don't do anything to support the community. And since they don't support the community, they don't even come into town. They just send the black people to come and buy things for them.

I: Has your income changed much the last five years?
R: The income is decreasing. In addition, we don't get the promised financial support from the government. The little we get from them we have to spend on school fees. These fees have also increase a lot.

I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: I don't know whether the government has policies on this. If, after taking out the gold, and they level the gorund as it was before, I don't have any problem with them. But now, they don't cover the land, so the government should have a policy for this.

I: What do you think about the actions taken to stop the illegal Chinese mining?
R: Stopping them is not the problem. Because now, when the Chinese people came to our country, they buy things from us, like food crops and everything. So it is helping us in this way. If they are sacking them, it will affect us negatively in this way. Instead of telling them to leave the country, the government should give policies to support the community, and that after they have taken the gold, they should cover the land so that it later can be used for farming.

Farmer 2
Day: 16.01.2014
Length of the interview: 06:24
Place of the interview: Manso Abore
Community she/he is coming from: Manso Aponopono
Where the community member is living: Manso Aponopono
Gender: Female
Age: 40
Occupation: Farmer, I also sell some toffee and biscuits outside.
Level of education: Junior High School
Marital status: Married
Nr. of children: 4
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 7
Level of income pr. month: No reply

I: What do you think about small-scale mining? Why do you not practice it?
R: These people come to their parents and buy the land from them, before they start mining on it. After taking out the gold, they don't level the land for them, so it cannot be used again. I do not practice small-scale mining. I am too old.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Things have changed from before the *galamsey* arrived. Now you see a lot of strange people every day in the community. The land I was thinking of working on later, is no longer possible to go to, because they have destroyed it. Now, the youth are even giving birth

without having a husband. A stranger would come in and sleep with them, and later on when they finish taking out the gold, they just leave, not thinking about the baby.

I: In your view, what is illegal mining/*galamsey*
R: *Galamsey* are the people who are not using enough machines. Instead of using excavators, they use small thing as picks to search for gold.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: First of all, when they take out the sand from the pit, they don't cover it again. So the water in the pit are producing mosquitos now. Second, we are no longer able to take water from around the farming area, so we need to bring it from home. Now, many youth stop going to school, because they want to work at the *galamsey* to have money.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: Because of their language, we don't get close to them. So it's the local people that do everything for them, buying the land, goods, food and so on. So the Chinese don't communicate with us. Only the local people who work with them have contact with them, they don't talk to others.

I: What economic impacts do you think the Chinese in general has on your household?
R: I'm not getting anything from the Chinese *galamsey* people, so the economic impacts is even getting worse. For instance, the school fees is higher than our salary. So whatever we earn from farming, we spend for these fees. We are unable to save any money.

I: Has your income changed much the last five years?
R: Since they have destroyed our cocoa, what we get now is less than what we did five years ago. So the Chinese people are not helping us.

What have local authorities done to deal with the problem?
I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: I don't know whether the government gave them any policies.

I: What do you think about the actions taken to stop the illegal Chinese mining?
R: I support that the government should sack them. Because if they sack them, we can have our land by ourselves to do farming.

Farmer 3
Day: 16.01.2014
Length of the interview: 06:34
Place of the interview: Manso Abore
Community she/he is coming from: Manso Adubea
Where the community member is living: Manso Abore
Gender: Female
Age: 55
Occupation: Farmer
Level of education: Level 4 (Similar to High School).
Marital status: Married
Nr. of children: 3

Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 10
Level of income pr. month: 6-700 GHS a year.

I: What do you think about small-scale mining? Why do you not practice it?
R: This is the people who use excavators, I know a lot of people who are doing it. I don't do it because I'm too old.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the Chinese *galamsey* arrived, living in the community was very good. We were all doing farm work. Before they arrived, the community didn't struggle for water, since it was everywhere around. But now they have destroyed everything.

I: In your view, what is illegal mining/*galamsey*
R: Illegal mining or galmsey, is not good work for people to do. Because all the youth don't want to go to school, they all want to work at the *galamsey* site.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: They have destroyed our water, and it produces more mosquitos now. You can even die at the *galamsey* site. Since they don't cover the pits, you can fall into it and die. Since the *galamsey* is very hard work, when you come home, you have to take a painkiller. So the youth are even getting unhealthy and old because it is so hard work and taking painkiller every night.

I: What social impacts do you think the Chinese in general has on the local community?
R: The Chinese people, when they come to our community, they don't stay with us. They stay at the bush where they are working. So they don't talk to us. If you want to see them, you have to go there.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: It's the same with the miners. Since they live outside, we don't talk to them.

I: What economic impacts do you think the Chinese in general has on your household?
R: It's only the leaders, the chiefs, in the community who are benefitting from the Chinese in the form of payment. The people who sell things also get some benefit, but for those who do not sell anything they have no benefit at all.

I: Has your income changed much the last five years?
R: From what I am doing I get around GHS 600-700, it depends on the cocoa production. So maybe around GHS 60 month.

I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: I'm not aware whether the government gave them policies. I can't go and do any job other than farming. The NGO called Care Planning are supporting us, and giving us training about farming. This has helped us a lot, and made our income increase. Since we did not know anything about the distance from one tree to another tree. But now we have gotten advice about this, and it gives us a much better production.

I: What do you think about the actions taken to stop the illegal Chinese mining?
R: Since the Chinese are destroying our land, I would support it if the government sacks them

Farmer 4
Day: 16.01.2014
Length of the interview: 09:27
Place of the interview: Manso Abore
Community she/he is coming from: Manso Abore
Where the community member is living: Manso Abore
Gender: Male
Age: 54
Occupation: Farmer
Level of education: Level 4 (Similar to High School).
Marital status: Married
Nr. of children: 9
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 15
Level of income pr. month: No reply.

I: What do you think about small-scale mining? Why do you not practice it?
R: I don't know anything about it. I don't practice it. I'm not healthy enough.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the *galamsey* arrived, when you were going to farm, you didn't have to bring water, you could just take it from the rivers around the farmland. But now, this water is destroyed. We now buy water in the small plastic bags when we farm. If you have your own farmland, I also have my own farmland, and you have sold you land, while I decide not to sell my land, do you know what will push me to sell it? When the *galamsey* are working on the land that you sold, the water they destroy there will pass my land and cocoa. The crops are thus destroyed, and make me want to sell the land to miners too. This makes the Chinese able to give whatever they like for the land, since we have no income, or alternative.

I: In your view, what is illegal mining/*galamsey*
R: The *galamsey* are the people who use excavators and a small bowl to wash the gold.

I: Do you know if the *galamsey* have papers?
R: I don't know.

I: What effects do you think Chinese illegal mining activities have on the local environment (agricultural land, water, air quality etc.)?
R: The Chinese are not around here, it's only the local people doing the *galamsey* in this community. It affects our water. Before the *galamsey*, we were even using the water around us to water the cocoa. But now we cannot use this water anymore. Our land has also been destroyed.

I: Do you know if the miners use mercury?
R: I don't know. But somebody told me, that if they use mercury, it can destroy our cocoa.

I: What social impacts do you think the Chinese in general has on the local community?
R: Sine we don't have Chinese miners around here, I don't know.

I: What economic impacts do you think the Chinese in general has on your household?
R: The government promised that they would give us fertilizers to use for farming. But they didn't give us this. The amount of bags of cocoa that we used to get every year has been reduced since we haven't gotten enough fertilizers.

I: Has your income changed much the last five years?
R: Yes, it has decreased. But this year, because of the lack of fertilizers it's hard to say how much I will earn.

I: Are you aware of any policies regarding the Chinese illegal miners? If yes, what are they? If no, why not?
R: I'm not aware if the government has any policies on them.

I: What do you think about the actions taken to stop the illegal Chinese mining?
R: Before they sack them, they should make them cover all their pits so that the land can be used again. It's my father who used the land I'm working for farming. So when he died, I took over. If the Chinese buy the land, and I die, my children will have no land to do the farming. So i support the government to sack them. But before that, I would ask the government to demand that the pits are covered.

I: If you sold you land to a Chinese miner, and I decided not to sell mine, is it not going to affects us?
R: Yes it will still destroy you product since the polluted water runs through your land. This is how they manage to obtain so big land areas. So the Chinese mining areas did not originally belong to one person, but to many, who one by one sold to them.

I: Do you know a farmer who has sold his land?
R: I don't know anyone who have sold their land. You won't see the farmer, when you go and ask the miners who sold the land to you, they would give you a different name, not the name of the farmer who sold the land.

I: What is your income?
R: Last year, the government provided us with lots of fertilizers, so we got good money, but this year they didn't provide this. The government used to hire people to spray the cocoa the 8th month. Last year they did this, but this year they haven't. Sometimes, when it's good, we can get 1000GHS in one year, when it's good. When it's bad, it might be around 6-700 GHS.

I: Those who sold their land to the illegal miners, is it because they don't get enough cocoa, or because they need money urgently?
R: I don't know why they sell their land to them. But if somebody sold their land, and the people working on it, destroys the neighbouring land, that neighbour would also sell his land. Sometimes the farmers and the *galamsey* workers fight against each other. This occurs when the *galamsey* work close to your cocoa. Those who are working over there would say that you have to go and talk to Mr Amoah, who is a contractor who buys the land for the illegal miners.

HR responsible
Demographics/statistics
Code
Day: 16.01.2014
Length of the interview: 11:18
Place of the interview: At Abzu mining site in Manso Nkwanata, Ashantie West, Ghana.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: I think the local community was a normal farming community. Before the Chinese *galamsey* arrived, there were local *galamsey* around, they were doing the *galamsey*.

I: Do you think the impact on the environment is worse with the Chinese *galamsey*?
R: think there has been no significant change. If you go to the communities around, you cannot be pointed to one development that has been caused by the Chinese *galamsey*. Then you cannot say that "this was provided by the local *galamsey*". It's the same.

I: But the amount of galamsey has increased due to the Chinese?
R: Yes, there has been an increase in number, the influx of people coming to work.

I: To you, what is the definition of illegal mining?
R: To me, illegal mining is people going to the land, and looking for gold without license or authorization. Because you need to acquire license from the government. And then also, you need to acquire the social allowances, that are from the host communities. But this are not forthcoming.

I: They need to travel far to acquire that license?
R: You need to go to Accra or Kumasi. The ministry has to come in, most of them are located in Accra. And then also, I'm sure the minerals commission also has to come in. Because of this centralization, some of these licenses can be acquired from the regional officers, for instance the Environmental Protection Agency, they have offices in Kumasi. I think they were just here, at our site, because we want to do the hard rock, so they came to look around. But if you, as you were coming, if you look, all those peaks you see the heaves of sand, are illegal *galamsey* activities. This man from our security went around to get some of them.

I: He took them to the police?
R: Sometimes we take them to the police, sometimes we just caution them and let them go.

I: How many miners are working in this company?
R: This company? At the moment I think we have around 175, I'm not sure.

I: How do you hire people here? They come here themselves to apply for a job
R: Yeah, people come here by themselves, other apply, others are by farers, they know somebody who know somebody.

I: Have most of them been in *galamsey* before?
R: Yeah, some of them have been in *galamsey* before. Some of us has been actual mining; New Mount, Agri Gold Ashanti and so on. So we have a blend. I started as a small-scale, the treadmill system, the alluvial system. Currently, that is what we are operating. We want to do the hard rock. Currently it's with mercury, but we want to do hard rock. So we have cleared

the sites, civil contractors are on site. So maybe in a year or two, they come and find the processing's plants and tanks and so on.

I: Will you say that the workers are very exposed to the mercury? Does it cause them any problems?
R: They are burning the mercury to get the gold. That is where they get into contact with the mercury.

I: They do it in a room?
R: In a room, yeah, they are present in a room. But we also let them go for periodic medicals, we want to make sure that they leave the company and will not come back and tell us that they got some deceases because they were here.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: The same effects as the local *galamsey*. The difference is the use of equipment, heavy machinery. The Chinese are more heavily equipped. Excavators, bulldozers and other heavy equipment. That's the difference. You know, our people, the locals, would maybe only use picks and shovels to dig. But the Chinese are more sophisticated.

I: I have visited some sites with local miners. They had some excavators, so is this because the Chinese started using it?
R: Yes, they are copying it.

I: So they didn't have it before the Chinese arrived?
R: No the traditional *galamsey* do not use these equipment. So the Chinese are worsening the impact. And then, sometimes you go to some areas where you think there are no activities going on. You will find the Chinese there. Sometimes it is very difficult to even know that they are there.

I: Do you have any idea of how many there are in the Amansie West District?
R: *Colleague replies*: From 50 to 60.

I: I have understood that the 1989 legalization of mercury was done to cope with poverty, and give the grass-root a source of income. Do you think it has benefitted them the way it was meant to do?
R: Yes, of course. You know, the place I come from, the western region, my mother's place. The last time I went there some years ago, but this year I had to go there, cause I lost an aunt. When I went to that village, I was more than happy. They have made use of the income from the *galamsey*. Put up buildings, modern buildings just like you have in Accra. So I was wondering, if they allowed to do some of them, at least had made use of what they have got.

I: How is the salary system in the company. Do the miners get a fixed salary?
R: Yes, they get a fixed salary, cause we are all permanent. It's comparable to what you get in any of the big mining companies. An equipment operator for instance, takes 1000 GHS a month. The only difference between us and the bigger companies is the benefits. We also cater for their hospital bills and so on.

I: You export most of your gold?
R: For the moment we sell most of it locally.

17.01.2014

***Galamsey* 1 Chinese Site**
Demographics/statistics
Code
Day: 16.01.2014
Length of the interview: 10:14
Place of the interview: Manso Nkwanta
Community she/he is coming from: Sunyani
Where the community member is living: Manso Nkwanta
Gender: Man
Age: 27
Occupation: Machine operator
Marital status: Married
Nr. of children: Wife pregnant in 6th month
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 2
Level of income pr. month: No reply

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: At first, there was no jobs in the community, so the life was very hard. Since I dropped out from school, there was no job for me. I was in a technical school, but had to drop out because of the financial situation.

I: In your view, what is illegal mining/*galamsey*
R: Actually, you know, Illegal mining is digging a hole without covering it. That is illegal mining. And illegal mining, is working without any licence.

I: do you consider yourself a legal miner? If yes, why? If no, why not?
R: Actually I'm a newcomer here, so I don't know. They have just employed me one month, so I don't know if they have license or not.

I: Do you think there are any negative aspects of practicing small-scale mining?
R: I can't tell.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: In some way, things are going bad, and things are going good too. I'm aware that they are destroying the land and the water too. But the Chinese has made borehole for us so that we get water to drink.

I: What social impacts do you think the Chinese has on the local community?
R: The Chinese people sometimes go to the community to talk to people. They have friends over there.

I: Does any of the Chinese have local girlfriends?
R: No, because the Chinese people I work with stay in Kumasi when they don't work.

I: Do you use mercury here?

R: No. When we finish washing by using floor maths, the Chinese take the sand with the gold to Kumasi, where they use the mercury to extract the gold.

I: Do you know if there are any negative aspects of using mercury?
R: No, I don't know anything about that. *Friend says*: I know that mercury is not good, it will destroy the living things in the sand, so it will destroy the land, and not make it suitable for farming.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: Yes. I work one hour for 10GHC. Sometimes I work 10 hours a day, so that I earn 100 GHC in a day. We get paid monthly. I am scared of the police, because I know that they can come and arrest us at any time.

I: So your are working for the Chinese?
R: Yes.

I: Is it the Chinese who own the excavators?
R: No they have rented them somewhere.

I: What is normal for a monthly salary?
R: Sometimes, 1000 GHS a month, and other times it can be 2000 GHS.

I: Paying 1000-2000 to you is ok, but what about the farmers that get their land destroyed?
R: Since the Chinese people paid a lot of money for one acre, the farmers are also ok.

I: Do you know if the Chinese has license for what they do here?
R: No, I don't know since I'm a newcomer.

I: If the government where to remove the Chinese *galamsey*, would you approve that?
R: No, because the Chinese people pay me well. Last year, I stayed in the house for 8 months without working. So if the government sack them, I would go back to that difficult life.

I: What does your parents do, are they farmers?
R: No. My mother is dead, and my father doesn't do anything now. I take care of my family, including my brothers and sisters.

I: How long has the Chinese been in this area?
R: I just came here and met them, so I don't know how long they have been here. I have been working with them for 1 month.

I: Is your father in this town?
R: No, he lives in Tarkwa.

I: When do you visit your family?
R: I visit them every month. When I see them I give them money.

***Galamsey* 2 Chinese Site**
Demographics/statistics
Code
Day: 16.01.2014

Length of the interview: 07:35
Place of the interview: Manso Nkwanta
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Gender: Man
Age: 30
Occupation: Machine operator
Level of education:
Marital status: Married
Nr. of children: Wife pregnant in 6th month
Religion: Ashanti
Ethnic group: Ashanti
Number of people in household: 2

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: Before the *galamsey*, we were all doing farming. If you don't want to do the farming, you have travel to Kumasi to find some job there.

I: In your view, what is illegal mining/*galamsey*
R: *Galamsey* work is people who search for gold. In my viewpoint this does not include those that have the big machines (excavator).

I: do you consider yourself a legal miner? If yes, why? If no, why not?
R: No this is not *galamsey*. We are doing small-scale mining, this is more than *galamsey*.

I: Do you think there are any negative aspects of practicing small-scale mining?
R: No, I don't know anything about that.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: After they take the gold out of the land, they do not cover it. So the land and water is destroyed, because they direct the water that they use at the site, to the river. I'm trying to advice those who do the *galamsey* to direct the water other places.

I: Are there any air pollution?
R: No, we don't crack any stones here, so we do not pollute the air.

I: What social impacts do you think the Chinese has on the local community?
R: The Chinese don't have anything to do with the community members. Because they are not living at the site, they live in Kumasi. They just come and work then leave.

I: What economic impacts do you think the Chinese illegal miners have on your household?
R: Though I don't sell things, but those who are selling say that the Chinese where helping them. They buy everything from them, and to whatever price. When the Chinese leave, the locals complain that nobody are buying things.

I: Has your income change much the last five years?
R: Things have improved.

I: So what is your average income?

R: If would have got 500 GHS per month that is enough to manage well. But I get more than that, but wish not to say how much.

I: Has the income from farming versus mining change much the last 10 years?
R: The Chinese people didn't come and force the people to sell their land to them. It was the farmers who sold the land to them, so If the farmers don't have money now, who should you blame? I'm still blaming the farmers who sold their land.

I: Do you know any farmers who have sold their land?
R: Yes, where they are working now, don't belong to me or the Chinese but to a different family who sold it.

I: Was it the Chinese people who came directly to buy the land?
R: No, it's the local people who buy it from the farmers, and then give it to the Chinese.

I: After selling the land, what does the farmers use the money for?
R: Some of the farmers who sold their land, used the money to support their children's education, others use it to maintain their hose. Because they need a graduate in their home.

I: If a family sold their land to support education or the house, what are they going to eat?
R: Sometimes the families who sell their land has another land which they use for planting food. But the income they had has been reduced accordingly.

***Galamsey* 3 Chinese Site**
Demographics/statistics
Code
Day: 17.01.2014
Length of the interview: 09:26
Place of the interview: Manso Emmem
Community she/he is coming from: Manso Nkwanta
Where the community member is living: Manso Nkwanta
Age: 22
Occupation: Machine operator
Level of income pr. month: No Reply

I: In your view, what is illegal mining/*galamsey*
R: Illegal mining is the people who are doing the work without having the license.

I: do you consider yourself a legal miner? If yes, why? If no, why not?
R: I am just a worker, I don't know if they have documents or not. So I don't know.

I: Do you consider what you do here illegal?
R: No.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: Since we don't have papers, it means that the community don't get anything from the miners. There's a lot of people doing the *galamsey* work, and they are destroying the land.

I: What social impacts do you think the Chinese illegal miners have on the local community?

R: The Chinese are helping the community in some way. Those working with them have money now, but it is the future that is the problem. The community came to the Chinese here, and said that they needed money to buy a generator for a clinic. So the Chinese paid GHS 5000 to them. And they paid another 2500 GHS for a road construction. And they paid 10 000 GHS for school block. They have also bought a water pump for the community. So this means, that they also have helped the community a lot. Before the *galamsey* work, I was sleeping with a friend. But now I have my own bedroom which I built. I even have a 3 bedroom building in Kumasi as well.

I: Has your income changed much the last five years?
R: Yes, it has changed a lot. Before this work, I was a chainsaw operator, and I was not getting enough money from that work. But now, with this work it is ok.

I: Mining and farming, which one would you advice people to do?
R: If I would advise people for the future, then farming is the best. Because cocoa lasts for long. Trees can support a family for 20-50 years, but the *galamsey* is very short term. Sometimes, even the farmers came to the Chinese and offered them their land for sale. The farmers sometimes need money, so they come to the operators and ask them to let the Chinese know that they have land that can be bought.

I: Are you aware of any policies regarding the Chinese miners?
R: I heard something like that. That the government announced that everybody should come and register in their company, so that when they finish the will fill the land again.

I: What do you think about the actions taken to deal with the Chinese *galamsey*?
R: I support whatever the districts officer will do, but what I'm asking for them is that they should talk to those doing the mining now, that whenever they finish they should level the ground. Here, where we work, we, the local workers cover the land again.

DCE (District Chief Executive)
Day: 17.01.2014
Length of the interview: 15:30
Place of the interview: DCE's office in Manso Nkwanta, Ashantie West, Ghana.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: It was basically a farmer community, who engaged in the farming of cocoa and the basic income was coming from cocoa and farm produce. I'll say, economically as compared to now, I think people have money these days, than before the Chinese came in. And then the *galamsey* operation was also, it's an old something that was going on back. Because they was using this manual. If they were to work in this office, it would take about two years before they would even finish working here. But now, it could take about a day. If you look at the damage, there is more damage. Before the Chinese came in, the *galamsey* was there, the farming too was also going on.

I: In your view, what is illegal mining/*galamsey*
R: Illegal mining is any mining activity where the person has not secured a license from the minerals commission, before engaging the mining.

I: How can they apply for this? Is it a difficult process?

R: What I know is, if I want to mine today, we have a district office around here. So you go there, and the officer will show a map of the areas they have blocked for mining. Both for small-scale and for large-scale. Once they have shown you the area you need to get maybe a SUV to go there and get the place for your site plan for you. You go there they will give you the application form, you will fill it and then you give the letter to the district here for us to do the publication. You publish it in the community where you are going to work. This person is coming to have applied for mining license to work at this place, to receive comment and if there is any objections from the community members. For 21 days, if there is no objection, then we give the letter back to the minerals commission that we did the publication and no objection was raised over that, so you can go ahead with the process of securing the license.

I: When you have a license, are you obliged to recover the landscape afterwards?
R: Yes, that is why we always insist on them getting the license. Because if you get the license then they have your (???). Even, as part of the process you will get a confirmation from the Environmental Protection Agency, so they will also be coming in to monitor. As I'm talking to you, even this problem of *galamsey*, the EPA is coming to establish and office here. They have one office in Kumasi, but they are, they need to come and establish an office, to make sure that they will monitor those working. So, once you have the land, you will be forced to run a responsible mining.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: Most of the farmland has been degraded and destroyed, then locally I think the cost of living is also higher. Because people have money, and the Chinese have money. If I'm selling this, for say 10 GHS, the Chinese will buy it. But the local people would not even have the money to buy.

I: Around how many percentage of the farmland would you guess is destroyed?
R: I'd say about between 30-50%.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: In every *galamsey* site, there are social issues of HIV and other diseases, they are all there. Armed robbery, and those, they are all there. And also we have some Ghanaian women who are impregnated by the Chinese and they have left. These are some of the issues.

I: How many incidents of hostility and conflict between Chinese and locals are known?
R: Last year, we recorded a very massive one in Siana, community here. And some places that time, because the Chinese will be doing this, and the community would say "no we don't agree that". So, at times there would be some attacks, where the communities where attacking the Chinese, and also the Chinese with guns and others attacking the community members. There has been none dying in these conflicts, only from falling into the pits.

I: What economic impacts do you think the Chinese illegal miners have on the local community?
R: The few local people that they engage, I think they pay them well compared to those engaged by the local people. I know definitely, that if somebody is engage by the Chinese *galamsey* operator, that person receives something much higher than the ones working with the local *galamsey* operator. They get a fixed salary at the end of the month.

I: What initiatives have been done in order to reduce the amount of Chinese *galamsey*?

R: I think, I came to office about three months ago. When I arrived here, there was a policy here saying that the national task force came in to and arrest some of the Chinese. And if they see some machines, you come and pay GHS 5000 just for the reclamation. But when I came, I thought we couldn't do that, because of the damage done, you cannot use 5000 to reclaim the land. So just as I'm talking to you, I have some machines here, what we are going to do is that we ask them to go back and cover the pit before we also give back the machines to them. That is one issue. We have also met some organized groups, some of them are not registered. We have also met them, and we have a plan that we are going to embark on reclamation, to cover most of the pits. So I'm talking to you now, and there is a big mining company in Ahafo, New Mount. We have written to them 18 from here we will visit them. They have some reclamation program. We want to just look at how they go about it and also come back and work on that. We currently do not charge this 5000 fine, we just ask them to cover the pits before we take the machines.

I: Do you think the current mining policies are working well? If yes, why? If no, why not?
R: I think the implementation is the issue. Because somebody will even come for the publication, but instead of the person going back to the minerals commission to continue with the presentation, they will just bypass everybody and go there and work. And at times, they will go to their normal places, they will have their lands. But after working on the land, instead of them reclaiming it, they will just run away. We have also planned that we send some local farmers who sold their land to the Chinese, then we send some of them to the court.

I: What forms of participation is/has been present?
R: I think, just this week. There is a Chinese mining company, they have secured license to mine in one of our communities. I went there with them, to the community, we introduced them to the chiefs and the entire community. And also we asked them to also come with their proposals, what the change the mining company should also support them.

I: Why do you think so many local miners are still unregistered and unwilling to register?
R: You know, one basic thing, is that when I'm registered. It means that my activity is going to be monitored, and they'll make sure that I do the right thing. You know people, we normally don't do the right, so if I got registered, then it means the EPA will come and monitor my activities. They will make sure that I will cover the pit and that one also comes with costs. Also, people don't even know the process. Some people, if I come and I explain it to them, they say "ok, we'v (???), go and to this and that". And at times, some may also say that I'll go to the minerals commission, and they will show me the map of the block areas. And I know that I go this part of the area, is where I can get enough gold. But it's not part of the block area. So I can't get it there. So definitely, I'd have to, just go there and do the illegal thing to make sure that I get the gold. These are some of the reasons. Because if I indefinitely, you see these parts, they are not part of the block areas, but they know that they can get a lot of gold there. So they decide to illegally go there and work, instead of waiting for their licenses.

I: I have understood that the 1989 legalization of mercury was done to cope with poverty, and give the grass-root a source of income. Do you have any thoughts on whether or not it has served this purpose?
R: In the short term, always, it has benefitted people. But in the long term I think the cost is even higher than the benefit. Because if you think about the health implications, I think it's not the best.

District Police Director
Day: 17.01.2014
Length of the interview: 08:31
Place of the interview: District Police Office, Manso Nkwanta, Ashanti, Ghana.

I: How would you describe the local community before the Chinese *galamsey* arrived?
R: It was ok. They were mining before the Chinese people came. But when Chinese people came, I think the problems got worse. They needed some infrastructures. Something like roads and others, and these people promised them the field in exchange for this. So it was a problem for the locals. The locals also started mining in different ways, using excavators.

I: In your view, what is illegal mining/*galamsey*
R: A miner without authority.

I: What effects do you think Chinese illegal mining activities have on the local environment (and agricultural land, water, air quality)?
R: Destruction of our rivers, lands. The effects are the same as from the locals. When they are finished, they do not cover their pits, they just leave it like that. And it will be filled with water. And normally these are farmers, they are going to farms and they do use those roads. So sometimes, some of them fall into the pits and die.

I: Are locals well informed about the health and environmental effects of mining?
R: Yes, they are well informed.

I: What social impacts do you think the Chinese illegal miners have on the local community?
R: Not so sure about that. It's something, but it is not good.

I: How many incidents of hostility and conflict between Chinese and locals are known? What caused them?
R: Several, but I cannot give you the exact number, but there has been many, around ten.

I: What economic impacts do you think the Chinese illegal miners have on the local community?
R: When they came, the local community, some of them was happy. Because the Chinese was buying things from them, what they sell; water, food and other things. Some of the Chinese was buying. So I think it improves the lives of some of the local people. It was ok for them.

What have local authorities done to deal with the problem?
I: What initiatives have been done in order to reduce the amount of Chinese *galamsey*?
R: At the moment, we have some of them in the system. But it's not for like (04:20 ??), according to the minerals commission now, those who have a concession, before you can mine, you have to see the Minerals Commission, the EPA, for you to obtain the proper document before you start mining. So I think now, everything is done.

I: What do you do to the Chinese miners when you arrest them?
R: We hand them over to the immigration department. And then they decide what to do. If they send it out of the country or not.

I: What are you doing after you have arrested local *galamsey*?
R: We send them to court.

I: How many do you arrest each month?
R: Roughly 5-6 locals, and many Chinese.

I: Do you think the current mining policies are working well? If yes, why? If no, why not?
R: Somehow. To me, they should have allowed the Chinese to cover the pits, before this problem came, they were not allowed to cover them, and there is so many pits. The government itself does not cover the pits.

I: Why do you think so many local miners are still unregistered and unwilling to register
R: One thing is, to my opinion. The money the charge when they go the minerals commission to obtain license before they mine. Because they cannot afford, they have to do it in a different way, without informing the authorities.

I: I have understood that the 1989 legalization of mercury was done to cope with poverty, and give the grass-root a source of income. Do you have any thoughts on whether or not this the change has been for the better?
R: In some way. In the long-term it will be a problem to us.

27.01.2014

Pharmacist
Day: 27.01.2014
Length of the interview: 04:03

I: Do you get many customers you know work as *galamsey*?
R: Yes, we do get quite many. We know that they are *galamsey*, because we ask them why they need the medicine they want. They reply it's because their work is so hard, explaining what they do.

I: What is the most normal drug for *galamsey* to buy from you?
R: What they mostly buy, is painkillers and malaria drugs, as well as sleeping tablets. When we ask them why you buy the sleeping tablets, because if you eat well in the evening, you can sleep. They say that because of the work they do is so hard, when they go to bed they can't sleep. There's one community called Wasa Ekuropong, where they have about thirty to forty chemical or medical shops over there. This is a *galamsey* community. Whenever they go there, they buy a lot of products, mostly painkillers and malaria drugs. Whenever they want to buy blood tonic, they ask if it will make them sleep well. We don't give them normal sleep tablets without prescription.

31.01.2014

EPA Officer
Day: 31.01.2014
Length of the interview: 39:49
Place of the interview: Kwame Nkruma University of Science and Technology

I: What is EPA's role in the small-scale mining sector?

R: EPA is a governmental agency that is responsible for giving environmental permit to prospective miners. It can be large-scale miners, medium scale miners, small-scale miners, but not illegal mining. So we are responsible to give environmental permit before you can get involved in any mining activities in anywhere found in Ghana.

I: What is the procedure if you want to get registered as a small-scale miner?
R: It's very simple: First, you have to get to minerals commission of Ghana, they will take you through their series, then after that you take the application letter from the minerals commission to the respective district assembly. There, they do what we call 21 day publication, it means that the concession that you want to mine, that will be put into public domain. The assembly is like a former advertisement, that mister A, B, C, D has applied to this assembly to engage in small-scale mining activities at, let's say, Manso Nkwanta town. So anyone who opposes it can come out, and that is for 21 days. After 21 days, if there is no objection, then the assembly OK's you, and give you the go ahead of a written documentation. So you take this written documentation from the assembly and then the application letter from the Minerals Commission to the EPA.

I: So you don't have to travel long distances to do this?
R: EPA is currently just located in the regional capitals. It is just recently that we are trying to get to the district assemblies.

I: You are planning to open an office in Manso Nkwanta right?
R: Yes, there is a plan, I'm going to work there now. So you will take your application letters to the regional capitals to locate EPA office. EPA office, a form will be sold to you called SM1, small-scale miner 1. That is where there are a series of questions. Like your name, address, what what, who's responsible from the concession. Then, the EPA, we only give license to concessions that is not more than 25 acres. So it's 25 or less. So if you go beyond 25 we will not even entertain your application. So it should be 25 or below. So when you are coming, you come with your site plan, for the concession. It will indicate the coordinate for the concession, so that you can trace. Then the acreage, the size, is also there. What district it is in, is also located on it. And then the name of you company. So you look for all this in the site plan. So when you come with the site plan, then we sell the site plan plus the application from the assemblies, and then the minerals commission, the three, you bring them to the EPA to buy the form, that is only 5 cedi. And then you go through the questions on the form. Some of the questions are where it is located, you indicate on it the size. Then you identify some impacts. Impacts of the small-scale mining activity on the community, and the mitigation measures. Whether it is near to the water body. These are the questions on the form. So you complete those forms, and then you attach those attachments from the assembly and the minerals commissions, then you submit to EPA. Then when we are satisfied, then we go through it. When we are satisfied, the office will book a date to field, to visit the site, your concession, wherever it is, two officers will go with you to the site.

I: When the miners start mining, do you monitor their practices?
R: When the permission is gotten, then the schedules, have conditions. The permit comes with conditions. So you pay 750 GHS for the permit. So when you have got this, that is the permit, you go to minerals commission, and then buy your digging permit, then you can start to work. Then once you have been given the permit, I said the permit has conditions. So occasionally the EPA will come there to see whether you confirm with the permit conditions that have been put on paper. That is why we monitor for.

I: Part of these conditions is that you should cover the land?
R: Yes, that is the very key. Either you do concurrent recovering, or after the period, you go back and cover it up. But, within the five years, normally 2,5 years, or 1,5 years, when the permit will expire. If you haven't finish the 25 acres, or whatever, then you come to renew it, so that you continue till you have finished 25 acres concession or whatever it is.

I: If the miner is illiterate, will he/she get help to do this whole process of registering?
R: Yes, he'd be helped. He'd be helped to go through all the registration. Most of the applicants are illiterate.

I: Do you know approximately how many Chinese illegal miners there are in the Amansie West now?
R: Is difficult for me to say, but they are many.

I: In your view, what effects do you think Chinese illegal mining activities have on the local environment?
R: You see, hm. Until the advent of these Chinese, the *galamsey* activities wasn't large scale. Because the miners were using simple simple instruments. They were not using bulldozers, excavators. So it was the Chinese who introduces this idea of this. So, let's say, in about a week, if a Chinese miner settles here for, in about a week, the kind of devastating effect that will occur. Like, they clear everything on site. If they have the belief that gold is located here, it's cleared on site. Meaning, even if it is vegetation it's cleared, even if it's forest, its cleared. And water bodies, they don't care. So, they destroy everything. Everything natural or artificial, when it's gold located there, the Chinese mine there. And because they use these excavators, they can cause a lot of trouble.

I: Do you think it have benefitted the local population in any ways economically?
R: Economic wise, to get money; yes. Because, they depend mostly on the Chinese to have access to whatever they want to mine. Normally, they Ghanaian will go in for the permit, if it is small-scale, the Ghanaian will go in for the permit, then the Chinese will use their technology. But if it is *galamsey*, they have a partnership. The Chinese man will use the Ghanaian as a laborer, to operate the machines, excavators, processing of the gold, it is all done by the Ghanaians. The Chinese man will also advice for this. But sometimes, they also operate on the machines that they bring, the Chinese. Sometimes they are found operating the excavators. So economically wise, yes, because, it makes it easier for them to get access to the gold. And when, if it is a partnership, they at least get some money to take care of their parents, and their children in school.

What have local authorities done to deal with the problem?
I: What initiatives have been done in order to reduce the amount of Chinese *galamsey*?
R: You see, you know, it was, it started this way. The Chinese came in as illegal people. They joined the activity or the operation illegally.

I: They had visa, so they were in the country legally?
R: Yes they had visa and they went through a visa process, and they entered the country. But how they get to the mining communities. That one, nobody knows. At times they are led by the Ghanaians, at times to, by their own people. Some of them who are there bring their colleagues from China, and then in Ghana here, sometimes the laws are very loose. So getting

to the airport, when they enter Accra city, they can find their way to Kumasi, and then to the mining areas. When they come, they bring their colleagues and they do their own thing.

I: So nothing has been done specifically to deal with the problem?
R: Yes, exactly. You know, when the situation was becoming worse, we started EPA and other alliance, we started talking against it, the illegal miners, then these immigrant, the Chinese illegal immigrants. So, we were educating the masses through radio, FM radio station, against their operations. So we saw that it wasn't carrying weight. It was no even any results. You know, the Chinese man, you go to him. When you speak, he won't mind you, he pretends as if he don't even understand English. So once he's there, and when you go to him, he doesn't mind you. So, me in particular, because I was assigned to those, I was only on them. So I was trying to find a way of getting rid of them. So I got know that somewhere around the line there should be some, let's say, presidential intervention. Because, as I was with them, they were telling me that, the miners themselves, they were telling me as for these Chinese, unless the government comes in, there is no way they will go. So, I was also broadcasting this on air. The communities listen to this. Even in Kumasi I had about three stations, that I said this, that there should be a presidential intervention, otherwise we are getting beaten by the bush. And the government, the president came in, and formed a task force. That was around August last year. I cannot recall precisely. So the government formed governmental task force on mining. Then appoint security coordinators. They will control the group. It involved soldiers, police, and some of the allied forces, including EPA. So, we in EPA, we were going to the site, so we know a lot of the sites, so it was like we were leading the task force, to locate where the Chinese were. So they started arresting them, taking their implements, seizing their excavators, and they machines, so they will be arrested and then brought to the regional coordinating council for questioning, and then for deportation. So within form August, unto, let's say December, the activity went down. It helped a lot. But know they have started coming.

I: The same people?
R: Same people! Those who were even departed.

I: But when they are departed, are they able to get a new visa to get in?
R: For that one I can't tell. But now they are there, they are increasing in numbers. So the exercise has even started again, the task force has started working again.

I: So it seems to me that this task force operations are not working in the long run. In your impression, what could be a more sustainable solution to the issue?
R: This thing should continue, the military there, they should be partnering, the EPA and other institutions to make sure that (???) and then, if the locals who lead them, could also make sure that they get permit, now they are very conscious, because of what the police just did to them. If you don't have permit, the Chinese sometimes, they don't want to side with you. So when you have permit and the conditions are there, they will go in for the mining and then reclaim the land.

I: So the Chinese now, will only work with locals that have permit?
R: Yes. No, largely, now.

I: So per definition, the mining itself is not illegal, but it becomes so because they don't cover it?

R: Yes, yes! Now, most of them have acquired permit, the locals. They are engaging the Chinese, so we cannot say this now an illegal thing. Sometimes, most of them are doing their work legally, only that we have to step up our monitoring activity so that we can see to the covering of the areas.

I: So, could it be an option to make it illegal to use excavators for the small-scale mining?
R: You know, in Ghana's law, you are not supposed to use excavators as a small-scale miner. It is not allowed. Small-scale miners just use small small instruments. So what they do now, is not small-scale, it's large. Because the kind of machines they're using, I don't call it small-scale mining.

I: So, it is the locals who own the land?
R: Yes, they buy it from the Chiefs. That is one of the biggest problems. They Chiefs will not go through the proper way of using their lands. In Ghana, wherever there is minerals found, and it's documented, that land does no longer belong to the Chiefs, it belongs to the government. But the Chiefs will not follow these rules. Once the land is within their locality, they sell it to them illegally, cause it's an illegal thing. So the chiefs are also to blame for this illegal mining.

I: Do you think the current mining policies are working well? If yes, why? If no, why not?
R: The laws themselves, they are working, but they are too loosely implemented. Because EPA like this, if, unless you are giving a permit you are not allowed to mine. But sometimes, when they go through the process and register and pay the permit, the most go to mine, which is illegal unless you hold the permit. So sometimes, it's difficult to monitor them. Cause you may think that once he hasn't gotten his permit, he is not working, but before we are there, he has finished his area. The amount of fees, to me is nothing, it's peanuts, 50 GHS, it's nothing. So the laws are there, but they are weakly implemented.

I: Why do you think so many local miners are still unregistered and unwilling to register?
R: You know that, to me, experience from the ground will tell me that most of the miners are prepared to register in the institutions. But sometimes ignorance is the cause; most of them do not know that there is a minerals commissions, assembly and the EPA. So we have to step up the education on that front. *phone ringing, talking in phone*.
Sorry about that. Yes, most are not aware. And those who are even aware, the problem they face is, it's like, there is some sort of delays.

I: They have to wait a long time before they are allowed to mine?
R: Yes! And most of them have gone in for a loan from the bank. So EPA, it takes longer time. You have to process the application here, and then send them Accra for permit to be issued. So that might take a lot of time, so the miner will not wait. But, sitting down with them, talking to them, educating them, they are saying it's too long. They can't wait. And most of them also do not know. Otherwise most of them will have come for permit. They are willing! Because most of them, I said, they don't want to go into the industry and only to be sacked by a task force or something. When they have their license, they can work. And they are saying that even the money they pay is peanuts. So they are saying that if they get their license early, they can go in and then we'll monitor them. So, one is ignorance for most of them, and sometimes due to the delay, it's a lot of bureaucracy in the issuance of the permit.

I: How long does it on average take to process the permit?

R: Look, i can tell you that we sent some application to the head office, after vetting them here, I think in the beginning of last year. They are still pending. So the miner will not wait for you, at Manso Nkwanta, you are here and he's at Manso Abboare. You cannot be there in the evening. So he go there and he do his own thing.

I: Up until now, there has been no education on the environmental impacts or health impacts?
R: There have been. But it has been weak, we have to step up!

I: Is it the EPA who does it?
R: Yes, EPA does it, and other institutions.

I: Currently, you think the local's awareness of the environmental and health effects is low?
R: For the health aspect I cannot say. But for the education on the registering, it is stepping up. Because after the task force, after their work, we saw an upside of people come to the office to register. It's just, you cannot believe it. Because they are prepared to register and get their permit.

I: Regarding the office you are going to open in Manso Nkwanta. What is your intention on opening that office, and do you have a specific strategy on how to reduce the amount of *galamsey*, both the Chinese and the locals.
R: As I said, the people themselves are prepared to register at the office of the EPA. But most of them does not even know where the head offices are located. So this will bring it to their doorsteps, and make it easier. They will easily get access to it.

I: When you have this office, are you also planning on other things, such as education?
R: Yes, like what we are doing in the regions, the same thing we'll do there. There will be a director there, with a team of aspects, who also do environmental education, water pollution monitoring and all those things. Yes.

I: I have understood that the 1989 legalization of mercury was done to cope with poverty, and give the grass-root a source of income. Do you have any thoughts on whether or not it has served its purpose?
R: For the population, yes. Because it has been able to help families to take care of themselves. But the impact they leave there sometimes also created poverty. Somebody will sell their land for let's say a cocoa farm for the GHS 5000, and he cannot utilize the money in any good way. So at the end of the day he has lost his livelihood, and he has spent the money for nothing. So it can bring poverty. But those who are engaged in the activity, economic wise, they have gained. So even when the task force were formed, and they were driving the miners away. Within the next one month, the villagers started crying, that they wanted them back. Most of the Chiefs there, they were saying that we should allow them to come back.

I: My impression is that maybe the farmers especially, should be educated regarding how their income will actually be in let's say 10 years' time, if they sell their land. So that they understand the economic long-term trend of it.
R: Yes, we do all these things, but they are interested in the quick money. Let him see the money, and he'll give up his cocoa farm. That's all they're interested in, which is bad! Now, you see that most of the farmlands are destroyed. So now, instead of them bringing food stuff to the city to come and sell, they come to the city to buy food to the villages. It's bad.

I: I also learned that when they sell their land to the Chinese for GHS 5000, the Chinese come and use mercury for the mining. They then pollute the neighbouring farmland as well, and then they get no crops. Thus, the owner of that land is desperate and the Chinese can buy it for an even lower price.
R: Yes, you see. From, I'm a water quality specialist. I take samples from the area. From mercury pollution, I cannot say is wholly true. Because they don't, now they don't normally use mercury. They use the gravitational method for extraction. And those who use mercury, especially the Ghanaians, the locals, the mercury is not used at the site. Even if it is at the bank of the river, they don't use the mercury there. They rather will start the process from there and then bring it home, to apply the mercury. So most of the water bodies, they are only coloured because of the clay. But if you test mercury presence, you get zero. They don't apply the mercury at the site.

I: Ok. Is this something resent?
R: Yes, it's resent. When we started educating them on the use of mercury, its poisonous nature of it. So especially when it enters water bodies, so they are no cautious about its usage. They will not use the mercury on the site. But it is dangerous for those who do the mercury process themselves, cause they burn, and they inhale the fees.

I: When did the Chinese miners start coming, and when was the peak activity and so on?
R: In-fact, for a calendar years, they started coming for this activity in 2009. And it became worse in 2011, 2012 and 2013. 13 was the peak. Up to the middle of 13. 12 it was gaining. 13, before the task force, it was uncontrollable. Now it has started again, and is gradually picking up. But now, they are cautious because what the soldiers did to them, they are trying to cover up the place they leave. And in our conditions, we set a buffer zone of 100 meters from the river bodies. So they are trying to observe that condition. I said that some of the hinterland you cannot go there, you might not know the, then they will go there and hide, and the will do their work.

I: If the Chinese cover up the land, and they work with locals who have permits and are registered. Is it all fine then and perfectly legal you think?
R: The laws says that it should be small-scale mining, so if it is a small-scale mining and it can be controlled. Because you cannot stop them. If you don't allow that, then they will go in for the illegal mining. So when they are registered and they can be controlled by the allied institutions. I think this is one of the best solutions. But to say no, I will not vote for that.

I: You think it should be possible for the Chinese to register for themselves?
R: The laws does not allow this.

I: But do you think it should be changed?
R: Yeah, the law, they should partner their Ghanaian counterparts. Then the Ghana man will go in for the permit, and we should step up our monitoring. The alliances should step up their monitoring at the sites, in order to control.

I: Thanks a lot, do you have anything else you want to add?
R: What I can add is that. To me if you don't mine, there is no development. Because, if you look around, everything centres around mining. The roof, the building materials, it is all from the ground. So, there should be mining, but the mining should be sustainable. A mining that will not destroy other natural environment and water bodies. And where there is mining, the reclamation should step up, so that we don't leave pits around. So if that one is followed, it

should be ok. And for mining, you cannot go away from mining. And, we know, here it has also employed a lot of the unskilled labourers, and those who do not have the proper education to look for white collar jobs. So it is helping them. If we don't allow that, we take them from the mining industry, there will be a lot of chaos, stealing and such. The laws should be applied, and then the allied institutions should make sure that their permits are release on time, so that they can monitor them. They shouldn't wait for a longer time. If the person don't have a permit, there is no way you can monitor the person. Once the permit are given you know where the person is, so you can go in to monitor.