

**UNIVERSITY OF CAPE COAST**

**SOCIAL ACCEPTANCE AS A GUIDELINE FOR PERMITTING  
QUARRIES IN GHANA: A CASE STUDY OF SEKONDI - TAKORADI  
METROPOLIS**

**PETER NTIAMOAH HODGSON**

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IN GHANA: A CASE STUDY OF SEKONDI - TAKORADI METROPOLIS

BY

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## **DECLARATION**

### **Candidate's Declaration**

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's signature:..... Date:.....

Name: Peter Ntiamoah Hodgson

### **Supervisor's Declaration**

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's signature:..... Date:.....

Name: Professor J. V. Mensah

## **ABSTRACT**

The Sekondi-Takoradi Metropolis is confronted with the problem of land litigation which is as a result of a number of activities including quarrying. This study set out to examine social acceptance as a guideline for permitting quarries in the Sekondi-Takoradi Metropolis. The study was both explorative and descriptive and aimed at going beyond existing information and delved into the unknown and brought to the fore what indeed the problem was and possibly identifies the causes and how they could be addressed. It covered 100 respondents selected through simple random sampling, systematic sampling and purposive sampling techniques. The main data collection techniques were in-depth interviews, focus group discussions and key informant interviews. The data were processed using the Statistical Product and Service Solutions (SPSS) version 16.

It was revealed from the study that though granite, the main resource for quarrying was found on the land belonging to the communities, they were not consulted in the process of granting permits to prospective proponents. Also, the Environmental Protection Agency (EPA) delayed the process for acquiring the environmental permit through the completion of the application form. It was recommended that traditional leaders (chiefs) and land owners should be adequately informed on quarry processes, the EPA should get a desk officer to help prospective proponents complete their application form, the Minerals Commission should educate proponents on the payment of royalties and the Assembly should adequately inform the communities on issues concerning notices published on quarry operations within the locality to promote social acceptance.

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## **DEDICATION**

To my wife Nelly Veronica Brown and my children Reindolf Sackey  
Hodgson and Isaac Ebo Nicklas-Coker.

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## LIST OF ACRONYMS

AAL	-	Acceptable Annoyance Limit
ADB	-	African Development Bank
APRM	-	African Peer Review Mechanism
ASM	-	Artisanal and Small Scale Miners
AVL	-	Allowable Vibration Limit
CDD	-	Centre for Democratic Development
DMC	-	Diamond Marketing Company
EIA	-	Environmental Impact Assessment
EIR	-	Extractive Industries Review
EPA	-	Environmental Protection Agency
ERP	-	Economic Recovery Programme
FAO	-	Food and Agriculture Organisation
FDI	-	Foreign Direct Investment
FGD	-	Focus Group Discussion
GDP	-	Gross Domestic Product
GIS	-	Geographical Information System
HIPC	-	Highly-Indebted Poor Countries
IFAD	-	International Fund for Agricultural Development
IRS	-	Internal Revenue Service
NGO	-	Non-Governmental Organisation
PMMC	-	Precious Minerals Marketing Company
PPV	-	Peak Particle Velocity

- SPSS - Statistical Product and Service Solution
- STMA - Sekondi-Takoradi Metropolitan Assembly
- UNCTAD - United Nations Conference on Trade and Development
- UNDP - United Nations Development Programme

## **CHAPTER ONE**

### **INTRODUCTION**

#### **Background to the study**

The utilization of environmental resource has been a lifelong pre-occupation of humankind from antiquity to the present day. This preoccupation could be traced from evolution of society through the primitive society, pastoral, horticultural, industrial and post-industrial periods, to the present day high-speed technology (Neubeck & Neubeck, 1997).

Throughout the whole period, humans have had relationship with their environment in the quest to satisfying biological and physiological needs, which include shelter using resources, especially land. When people started settling in communities and cultivating the land, they cleared relatively limited areas that served their needs (de Klemm, 1991). The utilization of the resources took the form of exploiting the environment to provide shelter or accommodation for survival.

In the primitive era, humans had unlimited access to land, air and water which supported their life. The population of this society was small and sparse. Humans used simple tools like clubs and spears in their hunting and gathering expedition, which had little or no impact on the environment. Early civilisation in Africa maintained close and harmonious linkages with nature, a tradition that is still clearly evident in many tribes. Humans had good relationship with nature and responded positively to its dictates.

In Ghana, in particular, people traditionally regarded the earth (Asase) as “Mother”, the provider and sustainer of life. They, therefore, offered prayers before cultivation and celebrated harvests with festivals such as Homowo (Ga), Ohum (Akim Abuakwa) and Odwira (Akuapem) to commemorate the generosity of Mother Earth (Danquah, 1968) quoted in (EPA, 1998). Robertson (1997) notes that until the middle of the 19<sup>th</sup> century the destruction of natural environment was very moderate.

However, as society advanced the demand for and access to natural resource use increased and became even more complex as the people congregated and in-breeding began, resulting in rapid population growth. With advancement in civilization, humankind increasingly sought to master nature, up to the industrial age. Advances in technology generally increased overall extraction of resources from the environment. The traditional method of using mud and clay to build with a thatched roof over it gave way to the use of modern ones. Other constructional needs such as socio-economic amenities led to the introduction of quarries. Though this has facilitated the provision of better and lasting structures, its effects on the land as well as communities cannot be over looked.

The deteriorating effect of human activities called for total and pragmatic management of the situation. In response to this, some level of interventions were initiated. Many mineral-endowed developing countries have increased their dependence on the extractive sector to achieve national development objectives by adopting fiscal policies for the attraction of more investment into the extractive sector (Aryee, 2001). Globalisation, which is sometimes described as an uneven process with unequal benefits and losses,



has resulted in increasing role of investors in the economies of developing nations. The Foreign Direct Investment (FDI) inflows to developing nations which was 17% from 1981-1990 increased to 32% in 1991-1995. This level of increase in FDI inflows to developing countries with the support of International Financial Institutions like the World Bank helped transnational corporations to gain control over the natural resources of developing countries, especially Africa (Songsore, 2003).

The period also witnessed growing conflicts between quarrying/mining companies and communities over involvement/participation, resettlement and relocation, and the associated compensation payment for property, including land and houses. The communities could not see any visible social projects in their areas resulting from the operation of quarries (Naito & Remy, 2000). There was waning social cohesion in communities affected by quarry, and with a permeating sense of the increased corruption of local authorities by quarrying companies. Traditional rulers were increasingly viewed by their subjects with suspicion, and largely regarded as collaborating with government and companies to deny the communities any benefits from quarrying proceeds. As a result the communities began to fight back (Akabzaa, 2004).

It is clear that the quarry industry can bring benefits to resource-rich communities and countries in the form of fiscal revenues. However, the extents of these benefits depend on the share of rents received by the countries or communities concerned, and the manner in which they are managed (Davis & Tilton, 2002). The level of rent and related benefits that a nation or a society can exact from the quarry sector depends on the provisions that are outlined in

the national mining legislation, and particularly the fiscal regime, as well as in investment agreements and stability agreements negotiated with individual mining/quarrying companies (UNDP, 2006). This provision defines the levels of taxes and incentive packages for investors in the sector but clearly ignores the role of the communities when it comes to the issuing of permits to the operators or the investors.

In 1983, the government of Ghana embarked on an Economic Recovery Programme (ERP) at the instigation of the World Bank, and with the support of, the Bretton Wood Institutions. According to the preamble of the ERP blueprint (World Bank, 1984), the exercise was an attempt to arrest the near collapse of the major export sectors of the economy, because of the lack of cooperation from the community dwellers in these sectors over decades. The cocoa, mining and timber industries, the major export sectors of the national economy, were major targets for these reforms, aimed at improving their competitiveness and attractiveness for FDI.

The main objective of the mining sector programme was to halt the decline in and stabilise mineral production, through short-term non-monetary, monetary and economic measures. This was to be done through sensitisation of the communities, involving them in the issuing of permits and the rehabilitation of existing mines by the injection of financial and technical assistance from multilateral institutions, and divestiture and liberalisation of the sector to promote an enabling environment to attract private investment (Songsore, 2003). In pursuit of these objectives, the Minerals Commission was set up as a mining investment centre in 1986. This was later followed by the strengthening of other mining-sector institutions such as the Geological

Survey Department, the Mines Department (now Inspectorate Division of the Minerals Commission), and the conversion of the Diamond Market Company (DMC) to the Precious Minerals Marketing Corporation (PMMC), in order to coordinate the marketing of all precious minerals sourced by small-scale miners.

The traditional rulers, particularly chiefs who statutorily benefit from the distribution of mining royalties, blamed mining companies and the central government for not giving them their fair share. They argued that they were unable to embark on development projects in their communities because their share of mineral royalty was insufficient, and began to agitate for their involvement in the negotiation process and an increase in their share (APRM, 2005: 116).

This call was strongly endorsed by the Chamber of Mines. Quarrying companies have been accused of doing little to assist local communities, but they contend that they have fully met their obligations to pay royalties and taxes, and that local communities were not benefiting because government allocation of mining revenues to the local level was minimal (Songsore, 2003).

There were similar and even more intense confrontations between mining companies and artisanal miners over land space. The artisanal and small-scale miners (ASM) were unhappy with statutory limitations on the amount of land they can lease, and the limit on the duration of their leases to three from five years. In some mining centres such as Adansi West (Obuasi) and Wassa West (Tarkwa), there is a lack of readily available operational grounds for ASM operators as most of the land is either in the hands of large-

scale mining companies or designated as forest reserves (Minerals Commission, 2007).

This means that most of ASM had no option but to encroach on the land leased for large-scale mining or on forest reserves. The resulting conflicts caused considerable and unexpected costs to the mining companies, government and local communities. It was apparent that there was little in the existing Mining Code that could be employed to resolve these confrontations. The emerging problems were partly blamed on the processes that had led to the 1986 Mining Code. The reform process was government-centred and took into consideration government and mining companies' perspectives without giving due regard to the views and aspirations of local communities and civil society (Minerals Commission, 2002).

It could be argued that government perspectives encompass the concerns and aspirations of the population, but that is a lame argument. It is inappropriate to assume that government interests are necessarily coincident with the interests of the wider public. Thus, any consultations that restrict communities which are critical partners in mining projects would almost certainly produce flawed results.

There was a general feeling that to address these concerns, any attempt at reviewing the Code should be inclusive enough to address the concerns of the various stakeholders, particularly local communities. In this sense, affected communities are automatic investors since they have to forgo their land, their most important natural heritage (Minerals Commission, 2001).

## **Problem statement**

There have been a lot of concerns raised in the areas of land degradation, pollution, deforestation relating to the operations of quarries, and gold mining in the Western Region in general and the Sekondi-Takoradi Metropolis in particular. The Environmental Protection Agency, Minerals Commission as well as the Metropolitan Assembly are doing their best to ensure that the problems are solved or reduced to the barest minimum. However, with the introduction of new companies and the issuing of more permits to operators into the mining sector by the regulators, the rate of land degradation, pollution as well as the neglect of the interest of the communities has been on the increase and the situation seems to be going out-of-hand (Minerals Commission, 2001).

Quarrying is done on both large and small-scale basis in the Sekondi-Takoradi Metropolis and with the help of modern technology, it has become possible for more tracts of land to be explored by these companies. The over-exploitation of the land by the quarry companies of their activities has led to a number of quarrels and disturbances between the communities and the companies.

The community dwellers who are of the conviction that the land belongs to them do not understand why their views were not sought regarding the issuance of permits to the operators. The communities also believe that when the companies are allowed to operate around, they would be deprived of their livelihoods. They would not be able to provide the basic needs of their families, which include provision for their children's education. These issues have informed the communities to use whatever means possible to ensure they

also operate within the allocated areas of the quarry operators with its concomitant effects of clashes sometimes leading to loss of lives and property.

The information presented on the social acceptance as guidelines for permitting quarries tends to suggest that there is a relationship between the variables. This study, therefore, sought to establish the nature and extent of the relationship between these variables.

### **Objectives of the study**

The general objective of the study was to examine social acceptance as guideline for permitting quarries in the Sekondi-Takoradi Metropolis.

The specific objectives were to:

- describe the stakeholders and procedures in granting quarry permits;
- discuss the role of the communities in the granting of permits to the quarry operators;
- assess the effects of quarry operations on the communities;
- discuss the challenges involved in issuing of quarry permits; and
- make recommendations for the purposes of policy formulation and implementation.

### **Research questions**

The research questions guiding the study were as follows:

- Who are the stakeholders and what are the procedures involved in granting quarry permits?
- What role can the communities play in the granting of permits to quarry operators?

- How do quarry operations affect the communities?
- What are the challenges involved in granting quarry permits?

### **Justification of the study**

One major problem challenging most developing countries in recent times is quarrying. Though there is a lot of literature worldwide on the subject, enough has not been done in terms of research to establish the link between social acceptance and the issuing of permit to quarry operators in Ghana. It is therefore important to undertake this study to add to the existing literature on social acceptance and the issuing of permit to quarry operators and also serve as a valuable source of information on the subject in Ghana as a whole and the Sekondi-Takoradi Metropolis in particular.

The findings and recommendations of the study would also enlighten the government, environmentalists, civil society organisations, Metropolitan Assembly and all well-meaning individuals who are concerned with finding solutions to social issues which have the tendency to starting disturbances in quarrying communities. They can use the findings to draw appropriate programmes and policies to combat the situation. It can also form the basis for further studies in the area of social acceptance and the issuing of permit to quarry operators in other districts in Ghana.

### **Organisation of the study**

The study is organized in five chapters. Chapter One focuses on introduction, which covers background to the study, statement of the problem, objectives of the study, the research questions, the justification of the study

and the organisation of work. Chapter two deals with the review of relevant literature. Chapter Three focuses on the methodology which includes the study area, study design, study population, methods of data collection and data analysis. The fourth chapter presents results and discussion while Chapter Five contains summary, conclusions and recommendations.



## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

#### **Introduction**

This chapter deals with the review of literature related to social acceptance as a guideline for permitting quarries in Ghana. Areas covered include definition and nature of quarry and quarrying, quarrying and land management, socio-economic effects of quarries, quarrying and development, the mining law and community participation, social acceptance and permitting of quarries, procedures and stakeholders involved in the issuance of quarry permits.

#### **Definition and nature of quarry and quarrying**

According to Akabzaa and Darimani (2001) quarrying is an open excavation from which any useful stone is extracted for building and engineering purposes. The two principal branches of the quarry industry are the dimension-stone and crushed-stone quarry. In the former, blocks of stone such as marble, are extracted in different shapes and sizes for different purposes. In the latter, granite, limestone, sandstone, or basaltic rock are crushed for use principally as concrete aggregate or road stone.

A quarry is a type of open-pit mine from which rocks or minerals are extracted. Quarries are generally used for extracting building materials such as dimension stones, construction aggregate, riprap, sand, and gravel. They are

often colocated with concrete and asphalt plants due to the requirement for large amounts of aggregate in those materials. Quarrying deals with the extraction of industrial minerals (Redmond, 2005).

Mining, on the other hand, is the extraction of valuable minerals or other geological materials from the earth, usually from an ore body, vein or (coal) seam. Materials recovered by mining include base metals, precious metals, iron, uranium, coal, diamond, limestone, oil shell, rock salt and potash. Any material that cannot be grown through agricultural processes, or created artificially in a laboratory or factory, is usually mined. Mining in a wider sense comprises extraction of any non-renewable resources (e.g., petroleum, natural gas, or even water) (Akabzaa, 2004).

Songsore, Yankson and Tsikata (1994) add that quarrying of stone has been done since pre-historic times. Modern mining processes involve prospecting for ore bodies, analysis of the profit potential of a proposed mine, extraction of the desired materials and finally reclamation of the land to prepare it for other uses once the mine is closed. The nature of mining processes creates a potential negative impact on the environment both during the mining operations and for years after the mine is closed. This impact has led to most countries adopting regulations to moderate the negative effects of mining operations. Safety has long been a concern as well, though modern practices have improved safety in mines significantly. Mining today is able to profitably and safely recover minerals with little negative impact to the environment (Commission for Africa, 2005).

Quarrying is carried out by different methods and equipment, such as hand tools, explosives, or power saws, and by channelling and wedging,

according to the purpose for which the stone is extracted (Campbell, 2004). Hand tools alone may be used for quarrying stone that lies in easily accessible beds. The principal hand tools are the drill, hammer, and wedge. A row of holes several centimeters apart is made with the drill and the hand hammer, partly through the layer, or stratum, perpendicular to its plane of stratification and along the line at which it is desired to break the stone.

United Nations Conference on Trade and Development (UNCTAD) (2005) also provides that in quarry operations each hole in a long row is filled with three wedges, shaped so that one may be driven down through the others, the method being known as plug and feathers; by striking each plug a sharp blow with a hammer, hitting them in succession, and by repeating the operation several times, the combined splitting force of the plugs and feathers finally becomes great enough to rupture the rock.

Explosives are most commonly employed for detaching large blocks of stone, which are then split and broken into smaller stones by wedges or by the plug-and-feathers method, or crushed by a heavy steel ball weighing several tons. In this method of quarrying, the drill holes are put down to the depth to which it is required to break the rock and are then partly filled with some explosive that is discharged by the usual methods of blasting (Redmond, 2005). To obtain finely crushed stones for concrete, primary crushers, of the jaw or gyratory type, and secondary crushers are used to reduce the size of the rocks (Cornia & Helleiner, 1994).

Channelling is the process of cutting long, narrow channels in rock to free the sides of large blocks of stone. Channelling machines, or channelers, formerly steam driven have now been generally replaced by gasoline or

electric engines. These are self-propelling and move a cutting edge back and forth along the line on a rock bed on which the channel cut is to be made. The channel cut is sunk deep enough to permit the insertion of wedges by which the rock is split, the cut or groove guiding the fracture (World Bank, 2003). The channelling and wedging process of quarrying is extensively used in quarrying marble, sandstone, limestone, and the other softer rocks, but is not successful for granite and other hard rocks.

Another method of cutting is by the combination of a power saw, an abrasive, and water as a lubricant and a coolant. The saw cuts a narrow channel, the primary or initial cut that is then either expanded by a wedge or is blasted. This method is used in slate, granite, and limestone quarries.

An automatic channel burner has recently come into commercial use in dimension-stone quarrying. It resembles a handheld burner held vertically in a frame, with an electric motor moving the whole unit slowly down a track. It makes a more even cut, does not require the presence of an operator, and wastes less rock. The unit is controlled by a computer (Killick, Kayizzi-Mugerwa, Savane & Nial White, 2001).

### **Quarrying and land management**

Land management is the issue of putting land resources into efficient use, meaning producing food, shelter and other products or preserving valuable resources for environmental or cultural reasons (Jahn, Khiev, Pol, Chhorn, Pheng & Preap, 2001). For this, information is necessary, which is to be provided by land information systems, sometimes called cadastre. The government at local and central levels need to provide an institutional setup

including policy and legislation, organisation for implementation of the policy and enforcement of the legislation and dissemination systems to make the information available in society, to benefit tenure security, property markets, land use planning, taxation and business in general (Gold, 1999).

Tools to support efficient land management include the establishment of efficient organisations, transparent procedures for decision-making and information technology for collecting, processing, archiving and dissemination of information. To be meaningful, the information needs a geographical component, which include tools for surveying and mapping and geographical analyses (GIS) (Dore, 1997). The system must be able to produce services to the general public at affordable costs. Land users, who benefit must feel that the fees they have to pay for the services are worth the value the system is producing for them. This is particularly important for pro-poor systems, if improved land management should be able to contribute to eradication of poverty (Falvey, 2004).

According to Dale and McLaughlin (1988), land management can be defined as the process of managing the use and development (in both urban and suburban settings) of land resources in a sustainable way. Land resources are used for a variety of purposes which interact and may compete with one another; therefore, it is desirable to plan and manage all uses in an integrated manner.

Miguel (1995) argues that for most people in the rural areas of the world, land is the basis of their livelihoods. It is a production factor in agriculture and an economic asset. Land is also the source of many conflicts. One thing at least is clear: secure rights of ownership, use and transfer, and

equitable access to land are indispensable conditions for sustainable development. In many partner countries where there are quarries, however, these conditions are absent.

Land is one of the most critical resources for the rural poor dependent on farming for their livelihoods. Today, about 2 million hectares of rain fed and irrigated agricultural lands are lost to production every year due to severe land degradation, among other factors (Hecht, Susana & Cockburn, 1989). This degradation is a critical link in a downward spiral with respect to poverty. Poor land quality compromises farm incomes, resulting in ongoing poverty and a lack of resources to invest in increasing land and labour productivity, condemning farmers to repeat the cycle often worsening degradation. Inappropriate land management, particularly in areas with high population densities and growth rates, further increases loss of productivity. This in turn affects food security and the potential for rural on and off-farm income generation (McRobert, 1993).

The challenge for developing countries is to develop land management programmes to increase the availability of high-quality fertile lands in areas where population growth is high, poverty is endemic, and existing institutional capacity is weak (Hayes, 2008).

The combined effects of deforestation, quarrying and land degradation served to expose the land surface to the torrential rains, which cause soil erosion and fertility loss leading to reduced crop yields, food insecurity, hunger and migration of local populations. Rio Tinto (2007) noted that even though many people now are aware of the negative effects of quarrying in causing land degradation and destruction of vegetation cover of the land, no

serious intervention measures have been put in place on a sustainable basis to arrest the menace.

Therefore, Environmental Impact Assessment (EIA) should be a prerequisite in the process of acquiring quarrying permit to ensure that all possible impacts are identified so that corresponding and appropriate mitigation measures are prescribed. Furthermore, other control measures or activities should be localized and supported by local laws or enforcement methods to ensure sustainable management of quarries (Cox, 1994).

Eggert (2000) contends that quarries can only be located where suitable natural resources exist. But quarrying activities also impact on the environment and can affect the 'amenity' or lifestyle of people that live near them. Finding a balance between these interests that sometimes compete represents a significant challenge — not only for the quarrying industry, but also for government and the community. Quarrying can co-exist with other land uses, provided they are not incompatible by being too close. If this balance is upset through poor land use planning decisions or poor quarrying practices, then the economic and social costs to a community can be high and reconciliation very difficult.

According to Eggert (2001), geology and geography restrict the location of quarries in the first instance. But many other factors must also be thoroughly evaluated before an extractive resource can meet company and community expectations for quarrying to take place. A range of extraction, processing, marketing, economic, environmental, social, legal and government criteria need to be carefully considered and assessed. It is perhaps not

surprising that it is becoming increasingly difficult to replace depleted quarries with new quarries.

The difficulty with maintaining a sustainable supply of extractive materials, sufficient to satisfy the future needs of our society is worsened if existing quarries are closed prematurely. This can occur if there is an intensification of incompatible land uses around existing quarries leading to the sterilisation or alienation of remaining extractive resources. The sterilisation of extractive resources, particularly from encroachment by urban development has emerged as a growing problem in some cities and towns across Australia (McMahon & Remy, 2001).

Baah (2005) holds the view that quarrying is an extractive activity. The quarrying of hard rock invariably involves blasting and the generation of noise and some dust. Quarries today minimize these effects through a range of operational and management controls but the amenity effects of quarrying cannot be eliminated entirely. A balance between the economics of quarrying, preserving the environment and preserving an enjoyable lifestyle for people that live near quarries, is achievable provided quarries adopt the best quarrying and land management practices available to them and appropriate separation distances are maintained between quarrying, their haulage routes and surrounding land uses.

Wyss (2003) notes that the major factors militating against the built industry in their operational areas include, ground vibration, flying rocks, dust pollution, audible noise and air over pressure. This is due to the fact that ground vibration causes cracks in buildings. Flying rocks also cause various degrees of damages; notable among them is perforation of roofs. Air over



pressure measured in dBL which is insensitive to the human ear (audible noise, measured in dBA) is worse in shuttering louvre blades.

The actual distance of separation is not always easy to predict. Because of this some quarries, once remote or established before houses were built, have found themselves or their haulage routes encircled by new urban development or other noise sensitive land uses. This can subject them to increasing complaint from adjoining or nearby landowners, raising the levels of community conflict, litigation and in some cases premature closure. This does not constitute the 'wise use of natural resources' that underpins one of the goals of sustainable development (Botchie, Gyasi, Akabzaa & Sarpong, 2006).

Extractive resources are finite and so quarrying involves a transitory use of land, though large resources may last for many decades until depletion. Quarries thus present a range of after-use opportunities. Many sand and gravel workings are water filled. Whilst some quarry sites are well situated for waste recycling and landfill (which itself represents a transitory use), and others for reinstatement for nature conservation, there exist numerous other potential after uses. These include built development (such as housing, commercial facilities, hotels, tourist parks, car parks), entertainment venues (for theatre and music concerts), agriculture, parklands and gardens or recreational facilities (Abugre & Akabzaa, 1998).

### **Socio-economic effects of quarries**

Quarrying, according to Adams (2001), is one of the occupations that have serious degrading effects on land. When out of control, it defeats the objectives of land management. When quarries are sited, apart from the

effects they have on plants, animals and ecosystems, human beings and their property are also affected. Many buildings are affected by the operations of quarry firms and large acres of land that could have been used for food and cash crop cultivation have been lost to quarries. African Development Bank (AFDB) (2006) explains that damage usually occurs where expensive residences are situated very proximate to quarry sites.

The people in rural communities where quarries are sited are also deprived of their livelihood. The government regulatory agencies or local authorities give the land out to the operators without holding comprehensive consultations with the communities (Candessus, 2001). They forget that most of these rural communities are about 70% agriculture and for that matter depend on the land for their survival. The only consolation these people are entitled to is the compensation that is paid to them based on the crops they lose to the quarry operation. However, this is woefully inadequate and rather worsens the plights of those who are the unfortunate victims or whose land is taken over by the quarry firms (Delbridge & Lowe, 1998).

Auty (1995) states that quarry can be beneficial to communities within their operational areas. He identified the following facilities as those that can be provided for the communities by the quarry firms:

- Provision of job for the community,
- Increase in commercial activities,
- Increase in the level of revenue generation of the community dwellers,
- Provision of social amenities such as schools, health facilities, roads, community centres.

The Food and Agriculture Organisation (FAO) assessment (1996/97) indicated that a greater percentage of Ghana's vegetal cover is affected by human activities such as bushfires, quarrying, lumbering. Hawthorne (1990) estimates that, about 35 percent of agricultural land which are fertile for both food and cash crops cultivation have been taken over by the extractive industry. A forestry department inventory between 1986 and 88 indicated that close to 20 percent of these extractive sites affect a number of protected areas. About 26 percent of these protected areas are under serious threat (Candessus, 2001).

### **Quarrying and development**

The unquestioning acceptance of development models based on increased Foreign Direct Investment (FDI) inflows in the extractive sector presents challenges to developing nations. The following are some of the moot questions on mining and development especially surface mining in developing countries. Who sets the development agenda for developing nations? Does benefit sharing in the development process favour marginalized groups? What is the cost of such development decisions to communities where multinationals site development projects? Are development processes participatory? (Owusu - Koranteng, 2005).

The differences in development objectives come with the many different development models that had either emerged from within these countries and many more, which had been prescribed by International Financial Institutions based on development models of industrialised countries. Such development models are based on the extraction of natural

resources and maximisation of consumptions with the aim of profit accumulation for the multinational companies (Agbesinyale, 2003).

Africa holds about 30 percent of the world's mining reserves, including 40 percent of the world's gold reserves, 89 percent of platinum reserves, 60 percent of cobalt reserves, and 46 percent of Zirconium reserves. The African continent with its enormous resources on one side and the grim picture of economic problems presents a paradox. In the 1990's the World Bank group catalysed the scramble for African's natural resources and granted some \$2.75 billion loans to private multinational companies for investments into the extractive sector (Owusu - Koranteng, 2005).

Ross (2001) indicates that most of the world's mineral-dependent states are concentrated in sub-Saharan Africa and an initial assessment suggests that the economies of these countries are not performing well. Twelve of the world's most mineral-dependent states including Ghana and six of the world's 25 most oil-dependent states are classified by the World Bank as "Highly –Indebted Poor Countries" (HIPC).

### **Mining law and community participation**

The Minerals and Mining Code and the Constitution of Ghana entrust decisions and use of mineral lands to the President for the benefit of the country (Minerals and Mining Act, 2006). Thus, government/ private multinational investors appropriate lands owned previously by families and communities in the event of compulsory acquisition of indigenous lands for mining (Government of Ghana, 1986).

The fundamentalism of the extractive industries to take advantage of the generally weak capacity of developing countries occasioned by weak regulations, prevalence of poverty and illiteracy of the indigenous people in areas of mineral extraction becomes a recipe for conflicts (Owusu - Koranteng, 2005). Poverty of mineral endowed countries has a bearing on the weak legislature that exists in the respective countries. The weak mining regulations existing in developing nations contribute to the externalisation of environmental cost of mining and thus help companies to achieve their profit maximisation objectives (Walde, 1992). Multinational companies see the weak environmental regime and the weak capacity of marginalised communities to protect their rights as providing the enabling environment for foreign investment in the extractive sector.

The call for changes in the mining and mineral laws of Ghana by mining communities, mining advocacy organisations and civil society in general is because the existing mining laws had failed to meet the objectives aforementioned. However, the mining lobby is also calling for mining law reforms with the objective of giving Ghana competitive advantage in the attraction of Foreign Direct Investment in Africa (Akabzaa & Darimani, 2001). The implication of the objective of the demands of the mining lobby is the further reduction of standards in the mining law. From 1994, more than 70 countries in the south have changed their laws to attract foreign gold mining companies.

The government of Ghana has initiated efforts at reforming the mining laws of Ghana and a new mining bill that was placed before Parliament was withdrawn because of criticisms from NGOs, communities and civil society.

The reason they gave was that there had not been adequate consultation of and effective participation of mining communities and other stakeholders in the discussions on the new mining bill (Owusu - Koranteng, 2005).

An interesting aspect of the new mining bill is the introduction of a Stability Agreement, which ensures that the incentives and protection that previous laws and agreements provided multinational mining companies in the law are guaranteed for 15 years. Indeed, the mining lobby wants a Stability Agreement for 30 years, which implies that within the period of the Stability Agreement, it would not be possible to alter any of the generous incentives provided under the law to the mining companies even if they are detrimental to national interest (Akabzaa & Darimani, 2001). Similarly, the Development Agreement, which concentrates a lot of power in the Minister responsible for mining on issues such as conflicts, has been criticised as a means by which the mining lobby could influence decisions and further erodes community rights (Centre for Democracy and Development (CDD), 2005).

When it comes to real benefits from mining investments based on the law, some mining companies have negotiated agreement for the retention of 80 percent of gold sales in offshore accounts. The contribution of gold sales to Gross Domestic Product (GDP) however is around 2 percent (CDD, 2005).

Though the provisions in the existing law do not adequately protect community rivers and water bodies, there is a provision for the Minister to issue a license to authorise the diversion and, impoundment of a watercourse for industrial purposes. Policy makers watered down this provision in the new mining bill. This may permit mining activities around important water bodies such as Lake Bosumtwi and the Volta Lake (Owusu - Koranteng, 2005).

The term participatory management is often used to describe all forms of management in which the community plays a major role beyond undertaking wage labour. Participation has been defined as a process whereby those with legitimate interests in a project both influence decisions which affect them and receive some, or all, of any benefits that may accrue (Sweeting & Clarke 2000).

Community participation in the management of their lands is of central importance as there is a clear relationship between human beings and land. But the extent to which people may exhaust a natural resource or participate in its regeneration and protection depends on the people's perception of that resource because perception guides and determines the way individuals or communities treat those resources (Mensah, 2003). If people perceive vegetative cover as belonging to them and benefiting them; today or future, their attitude, conduct and care for it will be quite different from looking at it as having no immediate use or largely to the benefit of others. Investment in natural resources under open access with no property rights will only then lead to use rates that are unsustainable and eventually deplete the asset (IFAD, 1995) quoted in (Mensah, 2003).

Mounting evidence has shown that when people have secured rights to adequate stocks of assets to deal with contingencies, they tend to take a long view, holding on tenaciously to land, protecting trees and seeking to provide for their children. Secured tenure or property rights to resources and adequate livelihood are therefore prerequisites for effective quarrying and sustainable development (World Commission on Dams 2000).

One of the best ways people can own natural resources is through participation. The term itself has a long history, and probably more practiced in traditional societies for their communal works before its formal devise and use in the development literature. The idea of all communities' members partaking in what belongs to all however lends itself to abuse and excessive exploitation. It was to prevent the unforeseen consequences of group ownership of resources that Hardin (1968) feared that if nothing was done, such a system could extinct common resources. He therefore proposed state intervention or privatization of property rights to preserve common-pool resources.

Hardin, like other property rights theorists such as Demsetz (1970) and North (1990) argued that common property resources would be over exploited as demand rose unless the commons were enclosed or protected by string state regulation. This view according to some scholars generated a great deal of pessimism in multilateral development institutions about the viability of local collective action in the provision of public goods and created a strong impetus for state provision of public goods, state regulation of common- pool resources, and an emphasis on the development of private property rights.

Though the "Tragedy of the Commons" had profound influence on development work, its general acceptance was being questioned by the 1990s. Ostrom (1990) shifted from this prescription of the management of common-pool resources to the potential for collective action in poor communities. For them, the theory could not survive general application because in real life, the capabilities of those involved in the destruction of common resources can be changed.



Ostrom (1990) assembled enormous wealth of evidence from case studies, which showed how indigenous institutions often managed common-pool resources – often very successfully. They concluded that Hardin’s “open access” was not the universal mode for managing common-pool resources and that “remorseless tragedies” were not an inevitable outcome. Studies by Jonah (1987) shows how land reforms in Rajasthan (India) led to the neglect of village pastures that were well maintained under the earlier feudal structure. Similarly, communal irrigation tanks in Tamil Nadu (also in India) fell into disrepair with the reduction in the feudal powers of village landlords - the idea then that privatization and social equity automatically ensure environmental sustainability can no longer be justified. Dasgupta (1982), for example, has given devastating critique of Hardin’s arguments based on the ways in which market-based mechanisms could be used to manage the commons rather than ruin it.

Sen, Chambers and Oakley (1991) therefore suggested capacity development of local people rather than top-down approach to development. Arguments in favour of “participatory development” subsequently led to its use as a means of allowing the poor to have control over their own decisions as how best to manage common-pool resources. World Bank assistance to projects with participation has risen to about \$7b annually indicating worldwide acceptance of the concept as a laudable alternative to rural development and poverty reduction efforts. Cohen and Uphoff (1985) strongly believes that participation should include people’s involvement in decision-making process, in implementing programmes, their sharing in the benefits of

development programme and their involvement in efforts to evaluate such programmes.

In talking about participation one cannot overlook the tremendous work carried out by Sen and others. Sen et al (1991) has carried out extensive work on participation using the works of many scholars like Hague et al (1991), Pearse and Stietel (1979), Lele (1991) and Cohen and Uphoff (1985) and has settled on different categories of participation.

### **Social acceptance and permitting of quarries**

Social acceptance to quarry operations is an important problem for mine and construction managers. On many occasions, people residing in the vicinity of a quarry operation become so annoyed that they resort to drastic means in order to halt the project, especially when it lasts a long time. In many quarry projects located in urban areas, the vibration thresholds should be based more on human response than on the probability of structural damage or harmful effects. The human response, however, depends on several natural factors and population characteristics unrelated to the vibration intensity and frequency. These factors should be taken into consideration when granting quarry permits (Baliktsis, Kaliampakos & Damigos, 2001).

Ideally, quarry operations were and should be permitted in “no man’s land”. However, with increasing population that scenario is not feasible and in the latter concentration should not be on structural integrity (Allowable Vibration Limit (AVL) to prevent structure damage) but rather on Acceptable Annoyance Limit (AAL) to reduce human nuisance (Baliktsis et al, 2001).

Many researchers and regulations have referred to social acceptance in quarry operations due to the blast vibrations. Nevertheless, observations from several case studies indicate that it is unrealistic to adopt vibration limits, based exclusively on peak particle velocity and frequency. The estimation of the AAL is a complex issue, since it is conditioned by factors and circumstances of the natural and man-made environment that, in many cases, cannot be weighed on the bases of objective criteria or on the results of strict models. Therefore, in each case a specific social acceptance standard should be adopted according to the particular conditions of the area. The most important parameters affecting social acceptance are classified into three groups namely:

- Natural environment conditions
- Blasting activity parameters
- Man-made environment factors

For the purposes of clarity, these factors have the following sub-headings. Under natural environment conditions we have geology, seismicity, other damaging geological phenomenon (ground water, landslides and loosened bedrock) and topography. Under blasting activity parameters we have proper blast design and scheduling, blast vibration monitoring, periodicity of blasting events and air-blast. Man-made environment factors also have the following sub-headings: population characteristics, building constructions and conditions, consequences of the project, existing nuisance levels, particularities of the area and public relations (Ostrom, 1990).

## **Procedures and stakeholders involved in the issuance of quarry permits**

According to article 257 (6) of the 1992 Constitution and Section 1 of the Mineral and Mining Law 1986 (PNDCL 153) now Act 703, 2006, every mineral in its natural state in, under or upon any land in Ghana, rivers, streams, water-courses throughout Ghana, the exclusive economic zone and any area covered by territorial waters or continental shelf is the property of the republic of Ghana and is vested in the government for and on behalf of the people of Ghana.

Furthermore, notwithstanding any rights or title which any person may have to any land in, upon or under which minerals are situated, no person can conduct reconnaissance of, prospect for or mine any mineral in Ghana unless he/she has been granted a mineral right by the Minister of Lands, Forestry and Mines on the advice of the Minerals Commission (Section 14 of PNDCL 153) in the form of a licence or lease as the case may be.

The following are the regulations that govern the quarry industry in Ghana: The 1992 Constitution of Ghana, Minerals and Mining Law 2006 (Act 703), Minerals and Mining Amendment Act 1994 (Act 475), Environmental Protection Agency Act 1999 (Act 490), Internal Revenue Act 2000 (Act 592) and Water Resources Commission Act 1996 (Act 522).

Apart from the above listed regulations the following subsidiary legislations also apply:

- Mining Regulations 1970 (LI 665)
- Explosives Regulations 1970 (LI 666)
- Minerals (Royalties) Regulation 1987 (LI 1349)
- Ghana's Mining and Environmental Guidelines, 1994

- Environmental Assessment Regulation 1999 (LI 1652)
- Environmental Assessment (Amendment) Regulation 2002

Any person who wishes to be engaged in quarry operation would need to acquire a licence through the following procedure:

- A prospective applicant for a quarry licence notifies the District/Regional offices of the Minerals Commission of his or her intentions.
- A prospective applicant is requested to acquire a piece of land (land ownership may be stool or family).
- A prospective applicant is requested to secure a site plan of the land acquired and submit to the head office of the Minerals Commission for a search to be conducted on the cadastral map.
- If found suitable, the prospective applicant is made to duplicate twenty copies of the site plan and attach twenty copies of an application form duly completed and submit to the head office of the Minerals Commission.
- The head office of the Minerals Commission would send copies of the site plan and the completed application form to the Inspectorate Division for inspection of technical suitability and to the Metropolitan/Municipal/District Assembly for publication for twenty-one days for conformity with the zoning status.
- The applicant is then advised to obtain an environment permit from the EPA.
- The applicant would pick an application form from any EPA Regional or District office.

- The completed application form is submitted to the EPA office in triplicate and the following must be attached to the application:
- Authenticated site plan of the concession
- A No Objection letter from the Metropolitan/ Municipal/District Chief Executives
- A Reclamation measure and Abandonment proposal
- The EPA official would visit the site to help screen and review the application.
- The applicant would pay the permit fee if application is approved.
- The applicant would then collect the permit at the EPA office within 30 days if the application form is adequately completed with the requisite information.

According to Minerals Commission (2002), quarrying is prohibited at the following areas:

- Source of drinking water
- Areas within township except where acceptable annoyance level could be adhered to.
- Areas near high tension and railway lines.
- Wildlife sanctuaries and forest reserves.
- Cemeteries, Mausoleums, sacred groves etc.
- Areas earmarked for developmental projects by Metropolitan/Municipal/District Assemblies.
- Other areas pre-blocked out before licences granted for quarrying activities.

The applicant then submits the environment permit to the Minerals Commission who would then recommend to the Minister of Lands, Forestry and Mines to grant the Licence. The applicant then purchases an operating permit and a way bill books from the Inspectorate Division of the Minerals Commission for the conveyance of quarry aggregate. While the operating permit is annual, the environmental permit is biennial and the quarry licence is granted up to a maximum period of five years.

## **CHAPTER THREE**

### **METHODOLOGY**

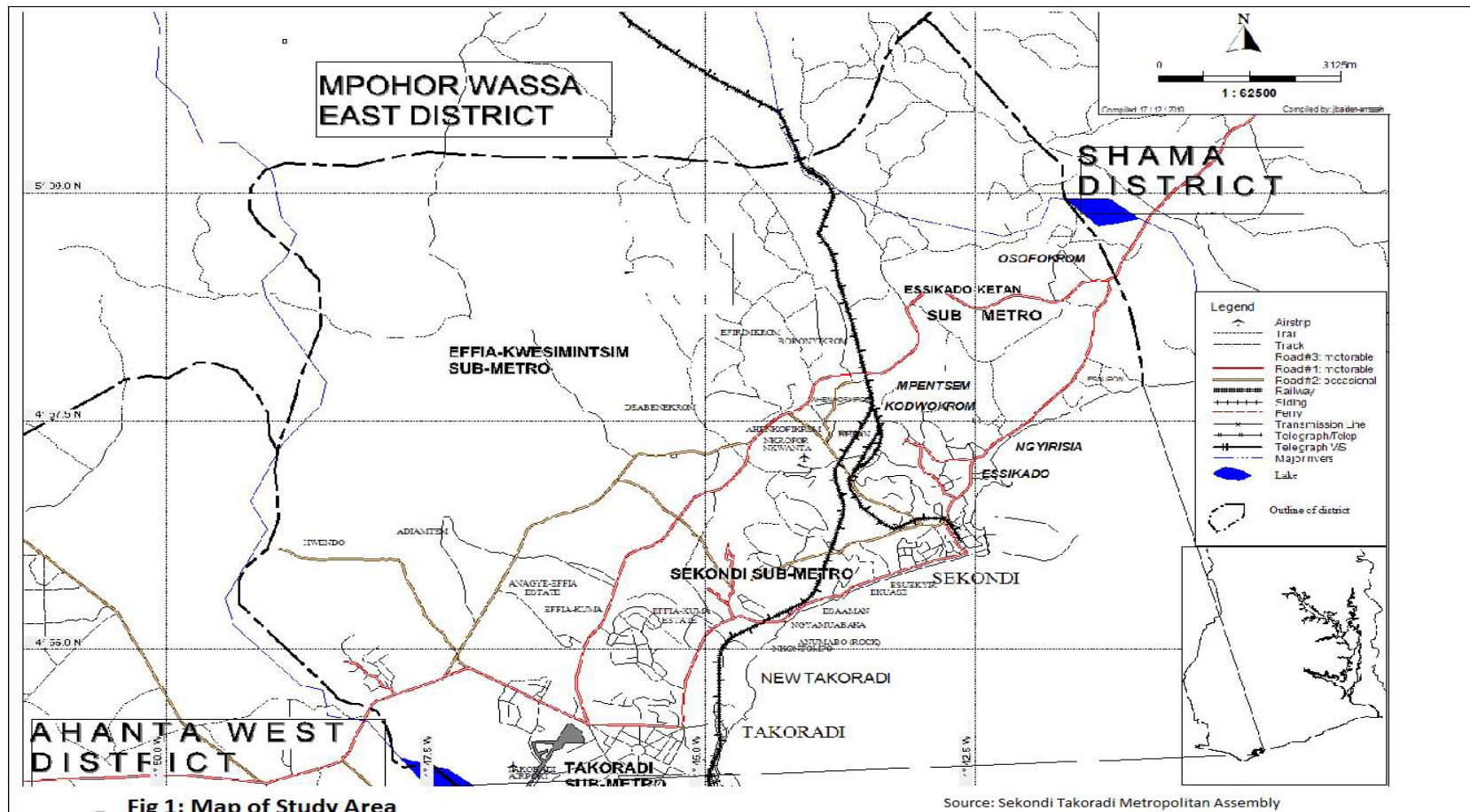
#### **Introduction**

This chapter looks at six areas, which constitute the study methodology. They are the study area, study design, study population and sampling methods. The rest are data collection techniques and data processing methods.

#### **Study area**

The Sekondi-Takoradi Metropolitan Assembly (STMA) was established by LI 1316 in 1994. STMA, however, started as Sekondi Town Council in 1903, under the Town Council Ordinance No. 26, until 1946 when Takoradi was brought into the administrative area of the Council. In June 1962, Sekondi-Takoradi was elevated to the status of a city and is currently one of the four Metropolises in Ghana (STMA, 2006). The metropolis covers land area of 385 square kilometres representing about 2.5 percent and 0.26 percent of the Western Region and Ghana respectively with a population of 95,140 people (Ghana Statistical Service, 2002). The metropolis is bordered to the west by the Ahanta West District, to the north by the Mpohor Wassa East District, to the east by the Shama District and to the south by Gulf of Guinea.





**Figure 1: Map of Sekondi Takoradi Metropolis**

Source: Sekondi Takoradi Metropolitan Assembly, (1999)

The metropolis is located on the West Coast, about 280 km west of Accra and 130km east of La Cote D'Ivoire. It is strategically located considering its closeness to the sea and airports and accessibility to major cities by rail and road. The metropolis has five quarrying communities namely; Mpeasem, Ngyiriesia, Mpintsin, Osofokrom and Kojokrom.

The economic activities of the people in the various area councils namely Sekondi Town Council, Takoradi Town Council, Effia-Kwesimintsn Area Council and Ketan-Essikado Area Council are by and large the same, varying from peasant agriculture endeavours including fishing to commerce and transport, artisanal activities like spraying, carpentry, mechanics, brewing and sale of alcoholic beverages. There are also small and medium scale industries in the wood sector, agro-industries like the oil-palm processing factories as well as quarries. The metropolis has hospitality facilities with varying sizes dotted along the sandy beaches.

Generally, the metropolis does not experience severe weather conditions. The average annual temperature is 22<sup>0</sup>C. The mean annual rainfall is about 1,380mm and where close to 70 percent of the rainfall takes place. These rains are sometimes accompanied by storms with slight thunderous activities. There is the second rainy season which is of short duration. The dry seasons are short and pronounced; a short one occurring from August to September and a more extended one from December to February which heralds the harmattan. The natural vegetation has largely been degraded due to slash and burn farming practices and other human activities. The existing vegetation is broadly woodland in the north and central portions of the

metropolis. Along the coastal areas, thickets intermingled with tall grass species are the predominant vegetations (STMA, 2006).

The metropolis is of varied topography. The coastline has features such as capes and bays which have suffered serious erosion around Sekondi, Essamang, Nkotompo and New Takoradi. The central area of Takoradi is low lying with an altitude of 6m below sea level. The numerous low lying areas in the metropolis are interspersed with ridges and hills ranging from 30m – 60m above sea level. Sekondi – Takoradi is characterized by faulted shales and sandstones of various types resting on a hard basement of granites, gneiss and schists. The faulting system has a marked influence on the landform, especially along the coastline which clearly follows the main fault direction of North East (STMA, 2006).

Between 1960 and 1984, the population of the metropolis grew rapidly from 152,607 to 249,371, at a rapid growth rate of 3.5 percent per annum. The figure was estimated to reach about 400,000 in 2000 and 359,363 in 2010.

### **Study design**

The study was both explorative and descriptive and aimed at going beyond existing information and delved into the unknown and brought to the fore what indeed the problem was and possibly identifies the causes and how they could be addressed. Polger and Shane (2000) observe that an exploratory study is conducted on a small scale and it is expected to be of short duration. The variables under the study are not to be manipulated for any reason since the research is intended to be non-interventional.

The choice of an exploratory and descriptive study in this study was based on the fact that concerns have been expressed by almost all stakeholders in the industry about the problems associated with quarrying and the neglect of community participation in the permitting procedure. The exploratory study was important on the grounds that even though the problem of neglect of community participation in the permitting procedure has been a subject of lamentation, it seems sometimes that the problem is being addressed only on the surface and in the process, not much in-depth attention has been paid to it with the view to finding out the causes and finding solutions to them. The exploratory study would then give way to a vivid description of the variables based on the observations made out of the ‘exploration’ and make the relevant recommendations and suggestions aimed at finding answers to the problem.

### **Study population**

The study population comprised residents of the metropolis, drawn from quarrying communities and relevant officials (regulators) of the Metropolitan Assembly and quarry operators who were purposively sampled. Traditional authorities and individual citizens in the communities were also randomly sampled and interview schedule made up of both open and closed ended questions administered to them in their respective communities.

The populations of the five quarry communities within the Sekondi – Takoradi Metropolis were Essikado 11,344; Ngyirisia 4,752; Mpintsin 1,860; Osofokrom 1,862; and Kojokrom 5,242 in 2000 (Ghana Statistical Service, 2002).

### **Sampling procedure**

The study was a district wide activity. However, opinions were solicited from five quarry communities in the metropolis namely Kojokrom, Ngyirisia, Mpeasem, Osofokrom and Mpintsin. Both non-probability and probability sampling techniques were applied to select the respondents. With regard to non-probability sampling methods, purposive sampling technique was used to identify key informants who were interviewed by applying the snow balling method. The key informants included; Assembly members, Chiefs, landlords, quarry operators, teachers and tipper truck drivers. This was intended to generate relevant information useful to the research. Five key informants were interviewed in each of the quarry communities totaling 25 in all.

For the general population, a total sample size of 100 was drawn from five quarry communities through simple random sampling techniques and interviewed by selecting every fifth qualified respondent in the respective communities. With a population of over 100,000, a sampling size of 200 (Kirk, 1955) would have been very appropriate, but the location of the quarries and sometimes inaccessible nature of parts of the roads necessitated the random sample size of 100 for the whole Metropolis shared on the basis of the population size of the five quarry communities. Owing to the population differences among the various communities, the sample population was shared on the basis of the population sizes. Essikado had a sample size of 35, Ngyirisia had 20, Mpintsin had 10, Osofokrom also had 10, and Kojokrom had 25 respondents, which brought the total sample size to 100.

## **Data collection method**

The data collection for the study was made up of the primary source and the secondary source. The primary source was through interviews which involved face-to-face interaction with the respondents and focus group discussions which brought targeted groups together while the secondary source made use of existing information from the regulators. Being rural communities, the literate population was small compared to the illiterate, as such in-depth interviewing was employed as the major technique for data collection.

The purpose of the research was interpreted in the local dialect (Fante and Asante Twi) for the illiterate respondents to condition their minds so that they would be able to express their opinions freely on the questions that would be posed to them. Also all the questions were interpreted in the local dialect for the illiterate respondents. A period of two weeks (16<sup>th</sup>-30<sup>th</sup> March, 2009) was used for the entire field work which involved two interviewers, the researcher and an assistant. The two-way communication between the interviewers and the respondents made it possible for the administrators of the instrument to closely observe both explicit and implicit expressions of the respondents (See Appendix A).

As stated earlier, the key informants included officials of specialized institutions who were concerned about social acceptance and the issuing of quarry permits such as the EPA, STMA, Traditional leaders (chiefs and land owners). A key informant interview schedule was designed, taking into consideration the key variables of analysis, research questions and objectives of the study (Appendix B).

The focus group discussion (FGD) was organized at each of the five communities, namely Essikado, Ngyirisia, Mpintsin, Osofokrom and Kojokrom. Discussions were organised separately for the different gender groups (males and females), and each group consisted of six members, the composition of which was to ensure proper representation of the categories that was chosen as the sample elements, that is the inspectorate division of the Minerals Commission, quarry operators, EPA officials and others already mentioned. Each discussion lasted for sixty minutes. A discussion guide was designed which covered key variables of analysis, the problem statement, research questions and objectives of the study. The justification for focus group discussion was to ensure detailed explanation, varied interests and opinions and assessment of gender differences on any given variable of analysis (See Appendix C). These together enabled an expatiated analysis of data from the interviews, alongside the secondary data.

### **Data analysis**

After collecting the data, editing and coding were done before data presentation. The purpose was to scrutinize the completed data collection instruments to identify and minimize possible errors, incompleteness, misclassification and gaps in information received from respondents. As Kumar (1999) contends, the cleaning of data revolves around issues such as forgotten questions, unrecorded responses, half-written answers; and illegible writings.

All interview schedules were serially numbered to facilitate easy identification for scoring and coding with the aid of a codebook. Frequency

distribution was ran after data have been inputted to give pictorial view of the information and findings. Data analyses were facilitated by the use of the computer program namely Statistical Product and Service Solution (SPSS) version 16. Cross tabulation was further used to show relationships between variables of interest in the study such as age and sex, educational background and marital status.



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **Introduction**

This chapter presents results and discussion based on the research questions and the objectives set out in the study. It covers the characteristics of the respondents, procedures and stakeholders involved in the issuance of quarry permits, the role of the communities in the granting of permits to quarry operators, the effects of quarry operations on the community and the challenges involved in the issuing of quarry permits.

#### **Characteristics of respondents**

This section presents the characteristics of the respondents in terms of sex, age, occupation, educational background and marital status. The purpose of this information is to put the study into context.

##### **Sex and age of respondents**

The sex and age of the respondents were necessary in this study because not only one sex and age group lived in the Sekondi-Takoradi Metropolis. Both sexes and different age groups stayed and carried out economic activities in the metropolis so there was the need to give them equal chances to respond to the interview schedules. The age of respondents was important in this study because it was to make sure that children were not

included so that the study would have adequate and relevant information on social acceptance and the permitting of quarries. It was also a useful tool to determine the economically active age group so that they could be involved in the various educational programmes carried out by the Metropolitan Assembly and other civil society organisations to help come out with strategic plans and measures to check illegal quarry activities in the metropolis.

Of the 100 sampled respondents from the community, 64 percent were males as shown in Table 1. The key informant interview also had 25 respondents with 5 from each of the quarry communities. However, the focus group discussions had equal representation as separate discussions were held for each of the sex groups. This sex disparity in the community and key informant interview came about because of the fact that most women felt issues concerning quarrying in the metropolis were related to men and on this basis they allowed their husbands to be interviewed when their households/the individuals were selected. The males did not have any problem at all responding to interviews and this accounted for their dominance in this study. However, most of the females who were selected for the focus group discussion participated effectively and were able to raise some issues on quarrying (processing) most men did not know.

A total 97 of the community respondents were in the economically active age of 20 – 60 years as presented in Table 1. The society expects the people in these age groups to perform a duty both socially and economically. As a result of this, they undertook various activities in any other form including tilling the land, fishing and felling of trees for charcoal and firewood

and conveying the bigger stones from the quarry face (pit) to the crushing ground.

**Table 1: Sex and age of respondents**

Age (Years)	Sex		Total
	Male	Female	
Below 20	2	1	3
20 – 29	36	18	54
30 – 39	13	7	20
40 – 49	9	5	14
50 – 59	3	5	8
60 and above	1	0	1
<b>Total</b>	<b>64</b>	<b>36</b>	<b>100</b>

Source: Field survey, 2009

#### Marital status and educational background of respondents

Marital status could influence family pressure on the respondents and the need to undertake activities to earn incomes. Food, shelter, education, clothes and medical care are mainly the responsibilities of parents and these cannot be done without money. The study revealed that, 59 percent of the sampled community members were married (Table 2). This implies that they had a lot of responsibilities on themselves, which could force them to till the land, burn charcoal, quarry, just to support their families. The other 41 percent would also want to meet certain basic needs and would have to rely on the land. For this reason, the land would be protected to ensure that quarrying was not done indiscriminately and that any individual or company that wanted to

go into quarrying must do so with a licence or a permit from the appropriate authority.

The educational background of these respondents was also taken into consideration during the study. This was because it could be a factor influencing respondents' perception of quarrying and the issuing of permits. Education could be viewed as a powerful tool to determine knowledge levels, skills and attitudes. The study revealed that 7 percent of the respondents had no formal education, 53 percent of the respondents had some kind of education from primary level to secondary level as shown in Table 2 while 11 percent had post-secondary education. Twenty nine (29%) of the respondents had tertiary education. On a whole, it was revealed that the singles had the highest percentage in terms of education. This could be partly due to the fact that they had fewer responsibilities as compared to the other groups where both the nuclear and the extended families put pressure on them.

**Table 2: Marital status and educational background of respondents**

Educational background	Marital status				Total
	Married	Single	Widowed	Divorced	
Nil	7	0	0	0	7
Primary	3	2	0	0	5
Middle/JSS	10	8	0	1	19
Secondary	9	19	1	0	29
Post-secondary	2	9	0	0	11
Tertiary	6	21	1	1	29
Total	37	59	2	2	100

Source: Field survey, 2009

### **Stakeholders in the granting of quarry permits**

According to article 257 (6) of the 1992 Constitution and Section 1 of the Mineral and Mining Law 1986 (PNDCL 153) now Act 703, 2006, every mineral in its natural state in, under or upon any land in Ghana, rivers, streams, water-courses throughout Ghana, the exclusive economic zone and any area covered by territorial waters or continental shelf is the property of the Republic of Ghana and is vested in the government for and on behalf of the people of Ghana.

Furthermore, notwithstanding any rights or title which any person may have to any land in, upon or under which minerals are situated, no person can conduct reconnaissance of, prospect for or mine any mineral in Ghana unless he has been granted a mineral right by the Minister of Lands, Forestry and Mines on the advice of the Minerals Commission (Section 14 of PNDCL 153) in the form of a licence or lease as the case may be (Minerals Commission, 2002).

The study revealed that all the one hundred (100) sampled community members as well as the key informants and the focus group discussion members admitted that there were stakeholders involved in the granting of quarry permits. The ready market for the quarry products made it necessary to bring the stakeholders to the fore in the permitting process to ensure that unnecessary litigations and illegal quarry operations were eliminated or reduced.

The study revealed that, 41 percent of the community members cited the Minerals Commission forms part of the stakeholders, 25 percent mentioned Metropolitan/Municipal/District Assemblies, 19 percent identified

Traditional Leaders (Chiefs/Land owners), and 15 percent also identified the EPA as being part of the stakeholders involved in the granting of quarry permits (Table 3). The key informant interview and the focus group discussion which provided supplementary information to the community interview also identified the same stakeholders in the granting of quarry permits.

**Table 3: The stakeholders in the granting of quarry permits**

Stakeholders	Frequency	Percent
Minerals Commission	41	41.0
District Assemblies	25	25.0
Traditional leaders (Chiefs/Land owners)	19	19.0
Environmental Protection Agency	15	15.0
Total	100	100.0

Source: Field survey, 2009

### **Procedures involved in the granting of quarry permits**

Besides the stakeholders who were involved in the granting of quarry permits, any person who wished to be engaged in quarry operation would need to acquire a licence through the following procedure:

- Acquire a piece of land from the appropriate land owner;
- Inform the Inspectorate Division of the Minerals Commission of his/her intention;
- Get an authentication notice from the appropriate MMDA;

- Present the site plan and the authentication notice to the EPA to inspect the site to ensure that it conforms to the zoning status of the area (Minerals Commission, 2002).

The study gathered information from the respondents sampled from the communities on the procedures involved in the acquisition of a quarry licence or permit. Different reasons were given on the issue during the administration of the interview schedule. Contacting the landlord/owner only obtained the highest (56.0%) followed by the EPA (17.0%) the Minerals Commission had (14.0%) while contacting the Assemblyman made (13.0%) (Table 4).

**Table 4: Procedures in the granting of quarry permits**

Procedures	Frequency	Percent
Landlord/owners	56	56.0
Environmental Protection Agency	17	17.0
Minerals Commission	14	14.0
Assemblymen	13	13.0
Total	100	100.0

Source: Field survey, 2009

#### **Effects of quarry operations on the community**

The challenge for developing countries is to develop land management programs to increase the availability of high-quality fertile lands in areas where population growth is high, poverty is endemic, and existing institutional capacity is weak (Hayes, 2008).

The combined effects of deforestation, quarrying and land degradation served to expose the land surface to the torrential rains, which caused soil erosion and fertility loss leading to reduced crop yields, food insecurity, hunger and migration of local populations. Rio Tinto (2007) noted that even though many people now are aware of the negative effects of quarrying in causing land degradation and destruction of vegetation cover of the land, no serious intervention measures have been put in place on a sustainable basis to arrest the menace.

In order to know and understand the actual problems of quarry operations on the community, the study looked at the effects of quarries on the communities. The respondents sampled from the communities identified the effects as including unhygienic sanitation (17.7%), flying rocks (15.9%) and water pollution (10.2%), ground vibration (16.4%), dust pollution/generation (11.5%), noise pollution (12.2%) and cracks in buildings (15.9%). It is only “others” that recorded less than 10 percent as shown in Table 9.

During the administration of the interview, it was discovered in all the five quarry communities that there were serious cracks on their buildings and some were almost collapsing. All the quarry activities observed during the administration of the interview schedule were very dangerous especially with the flying rocks which had caused severe holes in some roofs. It is also worth mentioning that respondents explained that each of the effects identified did not manifest itself in a worse state but began in a small way and gradually became uncontrollable with time.



**Table 5: Effects of quarry operations on the community**

Effects	Frequency	Percent
Unhygienic sanitation	68	17.7
Flying rocks	61	15.9
Water pollution	39	10.2
Ground vibration	63	16.4
Dust pollution/generation	44	11.5
Noise pollution	47	12.2
Cracks in buildings	61	15.9
Bad roads	1	0.3
Total	384*	100.0

\*The total number of responses exceeded the number of respondents (100) because of multiple responses.

Source: Field survey, 2009

The presentation in Table 5 is consistent with Wyss' (2003) assertion that the major factors militating against the built industry in their operational areas include, ground vibration, flying rocks, dust pollution, audible noise and air over pressure. This is due to the fact that ground vibration causes cracks in buildings. Flying rocks also cause various degrees of damages; notable among them is perforation of roofs. Air over pressure measured in dBL which is insensitive to the human ear (audible noise, measured in dBA) is worse in shuttering louvre blades.

### **Community consultation in the granting of quarry permits**

The study took into consideration the nature of quarry in the metropolis. There was an investigation as to whether communities were represented when granting of quarry permits. Out of the 100 respondents selected from the community and spoken to, 98 percent were of the view that the communities were not consulted when granting quarry permits and only 2 percent responded that there was some kind of consultation in granting quarry permits.

In trying to solicit reasons to ascertain whether the communities were consulted in the granting of quarry permits or not, the respondents came out with various alternatives as to how the communities should be consulted. For example, 20 percent were quick to indicate that the communities should be consulted through the chiefs. Some 30 percent pointed to the Assemblyman to be the point of consultation for the communities. Others, 38 percent were of the view that the communities should be given the chance to elect people to represent them. The consultation of the various family heads/Landlords was mentioned as a way of involving the communities. This attracted 12 percent of the total responses (Table 6).

**Table 6: Community consultation in the granting of quarry permits**

Representatives	Frequencies	Percent
Chiefs	20	20.0
Assemblymen	30	30.0
Elected individual	38	38.0
Family heads/Landlords	12	12.0
Total	100	100.0

Source: Field survey, 2009

### **Challenges involved in granting quarry permits**

The study solicited from the community members the challenges that were involved in the granting of quarry permits in the Sekondi-Takoradi Metropolis. The analysis revealed delay of EPA in granting environmental permit as the highest mentioned challenge recording 26.15 percent of the responses, followed by selling of land in bits with 19.41percent, changing of zoning status made 18.33 percent conflict of ownership of land 17.79 percent, not involving the people in the permit process recorded 15.36 percent and payment of royalties not straight forward had 2.96 percent of the responses respectively as indicated in Table 7.

**Table 7: Challenges involved in granting quarry permits**

Challenges	Response	Percent
Delay of EPA in granting environmental permit	97	26.15
Selling of land in bits	72	19.14
Changing of zoning status	68	18.33
Conflict of ownership of land	66	17.79
Not involving the people in the permit process	57	15.36
Payment of royalties not straight forward	11	2.96
Total	371*	100.0

\*The total number of responses exceeded the number of respondents (100) because of multiple responses.

Source: Field survey, 2009

### **Measures to overcome the challenges in granting quarry permits**

Considering the difficult nature of quarry operations and the activities carried out before obtaining a licence or a permit, it is necessary to identify some measures that can be put in place to ensure that the challenges in the granting of permit are eliminated or reduced. The analysis of the interview schedules administered revealed that 58.2 percent of the responses were not happy with the various processes prospective applicants had to go through but did not have any alternative measure that could be used in granting quarry permits/licence to prospective applicants. Responses indicating the various measures that could be put in place to overcome the challenges in granting of quarry permits to prospective applicants with their corresponding percentages are involving the people in the permit process (14.75%), payment of royalties to be straight forward (10.66%), re-zoning should be carefully done (6.56%), regular education (4.92%), formulation of bye-laws (14.92%) as shown in Table 8.

**Table 8: Measures to overcome the challenges in granting quarry permits**

Measures	Frequency	Percent
Not applicable	71	58.19
Involving the people	18	14.75
Attractive royalties	13	10.66
Careful re-zoning	8	6.56
Bye-laws	6	4.92
Regular education	6	4.92
Total	122*	100.0

\*The total number of responses exceeded the number of respondents (100) because of multiple responses.

Source: Field survey, 2009

## **Measures to be put in place to reduce the effects of quarry operations on the communities**

Baah (2005) holds the view that quarrying of hard rock invariably involves blasting and the generation of noise and some dust. Quarries today minimise these effects through a range of operational and management controls. But the amenity effects of quarrying cannot be eliminated entirely.

A balance between the economics of quarrying, preserving the environment and preserving an enjoyable lifestyle for people that live near quarries, is achievable provided quarries adopt the best quarrying and land management practices available to them and appropriate separation distances are maintained between quarrying, their haulage routes and surrounding land uses.

Baah's (2005) view on one way is true in the sense that if quarries are located closer to residence and other areas where people undertake certain activities for survival, they would by all means have effects on each other. It is very important to maintain a balance between the two to ensure smooth operation of the quarries and also a better lifestyle for the people.

However, the study does not accept that view. In granting permit for quarry operations, all these factors should be taken into consideration so that the quarries would not have to interfere with the people's usage of the land as their means of survival.

The study also obtained information from the people on what measures they thought should be put in place to reduce the effects of quarry operations on the communities. A lot of ideas and unintended information was collected on the effects of quarry operations on the communities. This was so because most of the respondents during the focus group discussions realized that other

people were talking freely about what they made out of the quarry operations in the communities so they were also motivated to provide theirs. One woman who was very instrumental in the discussion had this experience to share on the measures to be put in place to reduce the effects of quarries on the communities.

Quarry has been very helpful to me and my family. I initially thought it was solely reserved for men and for that matter did not want to venture there as a woman. It was very difficult and even becoming impossible to maintain my family, payment of my wards school fees was another issue that I never wanted to hear from the children and on a more serious note, I never thought I could own a house. All these benefits notwithstanding, I would want to make it clear that the operations of quarries, especially the mechanized ones have serious effects on the communities notably, cracks in buildings, perforated roofs, air pollution, noise pollution and water pollution.

In order to overcome these problems and make life comfortable or worth living for the community dwellers, the quarry companies should be compelled by the regulators to do the following: use proper blast design, monitor blast vibration, increase periodicity of blasting events with less effects (i.e. ground vibration and air over pressure) and should also reduce air blast.

**Box 1: Views of a respondent on measures to reduce the effects of quarry on the communities**

Source: Field survey, 2009

This presentation on the measures to reduce the effects of quarry operations on the communities notwithstanding, other people were of the view that it would be good if alternative or sustainable measures apart from what the companies should do were put in place by the Metropolitan Assembly in collaboration with civil society organisations (CBOs) and non-governmental organisations (NGOs) to reduce the effects of quarries on the communities. During the administration of the interview schedules, five (5) measures were suggested by the respondents which could help the reduction process. Educating the people on the need to cultivate other crops had the highest responses of 64 (37.6%), high cost on land for quarry 49 (28.8%), legislation or bye-laws on quarry 26 (15.3%), creation of other alternative jobs received 21 (12.4%) and support for other lucrative activities also had 10 (5.9%) (Table 9).

**Table 9: Measures to be put in place to reduce the effects of quarry operations on the community**

Measures	Frequency	Percent
Educating the people on the need to do other jobs	64	37.6
High cost on land for quarry	49	28.8
Legislation/bye-laws on quarry	26	15.3
Creation of other alternative jobs	21	12.4
Support into other lucrative activities	10	5.9
Total	170*	100.0

\*The total number of responses exceeded the number of respondents (100) because of multiple responses.

Source: Field survey, 2009

### **The link between social acceptance and granting of quarry permits**

Social acceptance to quarry operations is an important problem for mine and construction managers. On many occasions, people residing in the vicinity of a quarry operation become so annoyed that they resort to drastic means in order to halt the project, especially when it last a long time . In many quarry projects located in urban areas the vibration thresholds should be based more on human response than on the probability of structural damage or harmful effects (Baliktsis, Kaliampakos & Damigos, 2001).

Many researchers and regulations have referred to social acceptance in quarry operations due to the blast vibrations. Nevertheless, observations from several case studies indicate that it is unrealistic to adopt vibration limits, based exclusively on peak particle velocity (PPV) and frequency. The estimation of the AAL is a complex issue, since it is conditioned by factors and circumstances of the natural and man-made environment that, in many cases, cannot be weighed on the bases of objective criteria or on the results of strict models. Therefore, in each case a specific social acceptance standard should be adopted according to the particular conditions of the area. The most important parameters affecting social acceptance are classified into three groups namely:

- Natural environment conditions
- Blasting activity parameters
- Man-made environment factors

Despite the fact that the issues on quarry bother many people care needs to be taken in analysing the technical nature of the operation quarries. Though the respondents had no knowledge about what Dunlap (1993)



identified as functions of the land, they still maintained that it is important to protect the land not only for their immediate use, but also for the yet unborn generation. Religious values were attached to the land by the respondents. They were plain to mention that if they treated the land anyhow by allowing it to be used for quarry and also allowed to be degraded, the gods would not leave them free.

Based upon these views, various suggestions were made on the measures the society as well as the regulatory agencies should do to achieve social acceptance as guidelines for permitting quarries in the Sekondi-Takoradi Metropolis. Of the total responses, 35.3 percent suggested the elimination of selling of land in bits, 24.9 percent mentioned that the EPA should be fast in granting environmental permit, 18.6 percent added that the Town and Country Planning Department should be careful in the changing of zoning status of the area, 7.7 percent related to the prevention of conflict of ownership of land and 5.4 percent went for the fact that payment of royalties should be made straight forward by government machinery (Stool Lands and Internal Revenue Service (IRS) while 8.1 percent went for the idea that the communities should be consulted in the process of granting quarry permits (Table 10).

**Table 10: The link between social acceptance and granting of quarry permits**

Measures	Frequency	Percent
Not selling land in bits	78	35.3
EPA should grant environmental permit on time	55	24.9
Zoning status should be changed with care	41	18.6
Conflict of ownership should be avoided	18	8.1
Payment of royalties should be clear	17	7.7
Involving the people in permit process	12	5.4
Total	221*	100.0

\*The total number of responses exceeded the number of respondents (100) because of multiple responses.

Source: Field survey, 2009

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **Introduction**

This chapter contains the summary, conclusions and recommendations of the study.

#### **Summary**

Quarry is very common in the Sekondi-Takoradi Metropolis and with modern technology it has enhanced the production of quarry aggregates of various sizes as well as the dust. The study set out to examine social acceptance as a guideline for permitting quarries in the Sekondi-Takoradi Metropolis.

A combination of purposive sampling and simple random sampling (the lottery method) was used to select twenty-five individuals as key informants, three groups made up of twelve members each for three sessions of focus group discussion as well as hundred people from the five quarries as respondents.

The key findings of the study are:

- The stakeholders involved in the acquisition of quarry permits were the Minerals Commission, the Environmental Protection Agency (EPA), the Sekondi-Takoradi Metropolitan Assembly and the Traditional Leaders/Land Owners.

- Any prospective applicant for a quarry permit must in the first place secure a piece of land appropriately and then follow the laid down procedure by contacting the Minerals Commission, STMA, EPA and the Traditional Leaders/Land Owners for appropriate documents.
- The communities did not play any role in the process of granting quarry permits to prospective applicants.
- The effects of quarry operations on the communities included uncontrolled ground vibration causes cracks in buildings while accompanying air blast caused shuttering of louvre blades, air and water pollution, perforation of roofing sheets by flying rocks and noise pollution.

The challenges involved in issuing of quarry permits included;

- Landowners sold out the land in bits just around the outcrop or granite rock in the bid to get a lot of clients thereby going contrary to the standard set by the commission for every quarry to have a buffer zone.
- The planning scheme of the various Metropolises kept on changing thereby truncating the life span of quarries and/or sitting of new ones at distant locations with attendant increasing overhead expenses which turned to be unattractive to proponents.
- Family or stool lands where there was litigation, one parcel of land happened to be sold to different clients by different persons each claiming to be the rightful landlord or owner and consequently, some clients turned to pay more than once for the same parcel of land thereby discouraging the regularization of operations.

- The granting of quarry permits to prospective applicant was through the top - down approach and did not seek the consent of the people in a particular area where the quarry was operational. This was so because according to article 257 (6) of the 1992 Constitution and Section 1 of the Mineral and Mining Law 1986 (PNDCL 153) now Act 703, 2006, every mineral in its natural state in, under or upon any land in Ghana, rivers, streams, water-courses throughout Ghana, the exclusive economic zone and any area covered by territorial waters or continental shelf is the property of the Republic of Ghana and is vested in the government for and on behalf of the people of Ghana.
- The traditional leader or landlords after giving out their land to prospective proponents did not know afterwards how, when and where to access the royalties. This turned out to make landlords to coerce proponents to go ahead with their operations to after land acquisition to get their reward from inception instead of terminal and this tended to promote illegality which was tantamount to social unacceptance.
- The EPA was unwilling to direct prospective proponents as to what to do on the environmental permit form. This tended to discourage proponents in the pursuit of regularizing quarry operations hence, illegalities.

## **Conclusions**

Social acceptance as a guideline for permitting quarries is an important issue for the extractive industry in the study area in view of the aforementioned findings. This was indicated where views were sought on the

perception of the effects of quarrying on the communities in the metropolis. All the 100 community members interviewed, the 25 key informants and the three focus group discussion sessions, agreed that quarry operations had some negative effects on the communities. The problem was real and could be traced to the regulatory agencies in the process of acquiring the license/permit, landlords through the acquisition of land and benefits derived from the operation. This was identified during the administration of the interview scheduled. To be able to overcome this, there was the need to educate the people on their civil rights, environmental protection and sustainability of the natural resource and also appropriate measures put in place to implement the above in the metropolis.

The granting of quarry permit revolved round four stakeholders namely the Minerals Commission, Environmental Protection Agency, Metropolitan Assembly and Traditional Leaders/Landlords. Any prospective proponent needed to notify all the four before a recommendation was made to the Minister of Land, Forestry and Mines for the licence/permit to be granted. The communities had no major role in the permitting process except to dispose of their land to the prospective proponents.

The procedure for granting quarry permit to prospective proponents was characterized by a number of challenges. The land owners sold the land in bits to the prospective clients in order to get more money. Though this issue was beneficial to the land owners, it was against the standards set by the Minerals Commission for every quarry to have a buffer zone of operation. Another challenge was the frequent change of the zoning status by the Metropolitan Assembly due to population explosion. Conflict of ownership of

land was the third challenge. In stool/family lands where there was litigation this challenge was common whereby a proponent might be made to pay for the same parcel of land twice or even more by different people all claiming ownership. The people within the communities had the feel that they were not consulted in the process of granting permit to prospective quarry operators. They had the notion that they had been alienated from their own resource and a source of livelihood. It was also clear from the responses that quarry operations had some negative effects of perforating roofs, cracks in buildings, dust pollution and noise pollution.

In the acquisition of an environmental permit, the EPA delayed the process. Most of the prospective proponents were not well enlightened to be able to complete the application form themselves. The proponents were rather directed to see consultants to help them complete the application form. The mere mentioning of a consultant scared the proponents from following the normal process to regularize their operation thereby leading them to go into illegal quarry operations.

### **Recommendations**

Based on the conclusions, recommendations are made to the STMA, traditional authorities and land owners, EPA and the Minerals Commission. The Metropolitan Assembly should:

- Formulate policies and bye-laws specifically on quarry operations and processes at the local level and ensure that they are adhered to.

- Support inhabitants through the poverty alleviation programmes to engage in other jobs which are lucrative instead of concentrating solely on quarry operations.
- Put monitoring and evaluation measures in place to determine whether the people are actually aware of the publications that are made on quarry operations within the stipulated twenty-one days.
- The changing of the zoning status of communities within Metropolitan Assembly should be done carefully so that there is no conflict between developmental projects and economic activities.
- Institute an educational programme on a local Radio Station to get the communities informed on the processes and the bye-laws on quarry operations.

Traditional leaders (chiefs) and land owners should be advised to:

- Be educated on mineral processes where minerals are found on their land so that they would not sell their land in bits to prospective proponents without buffer in the case of a quarry. This would ensure conformity with the standards set by the Minerals Commission.
- Settle the petty squabbles among them in relation to the ownership of land so that the problems are not transferred to prospective proponents who would want to carry out an economic activity on the land.
- Keep proper documentation on land issued out to companies so that the companies can be compelled to perform their social responsibilities when they falter.



Environmental Protection Agency should:

- Have a desk officer to assist the prospective proponents to complete the application form for an environmental permit instead of referring them to consultants which scare the proponents.
- Be strict not to compromise the environmental protection standards that have been set in the process of granting an environmental permit to prospective quarry operators.

The Minerals Commission should:

- Educate the operators on their responsibilities of paying 3% of their proceeds as royalties to the stool lands so that the various stools/families on whose land quarry operation is taking place can receive their share.
- Ensure that the pre-license inspection to determine the technical suitability of the land for quarrying is not compromised to undermine the standards that have been set already.

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## APPENDICES

### APPENDIX A

#### INTERVIEW SCHEDULE FOR COMMUNITY MEMBERS

This interview schedule has been designed to collect information on Social acceptance as the guideline for permitting quarries in the Sekondi-Takoradi Metropolis. The purpose of the study is to write a dissertation to the University of Cape Coast in partial fulfillment of the requirements for the award of a Master of Arts Degree in Environmental Management and Policy. Your cooperation as a respondent is highly solicited in making this research a success.

#### Section A: Background of respondent

1. Sex            Male [    ]            Female [    ]
2. Age (years).....
3. Occupation (you may tick more than one)  
    [    ] Food crop farming    [    ] Livestock rearing [    ] Charcoal burning  
    [    ] Quarrying/Crushing    [    ] Petty Trading  
    [    ] Fishing [    ] Others (Specify) .....
4. Marital status  
    [    ] Married    [    ] Single    [    ] Widow /Widower [    ] Divorced  
    [    ] Separated            [    ] Others (specify) .....
5. Educational background  
    Nil [    ]                    Primary school [    ]            Middle/JSS [    ]  
    Secondary school [    ]            Post Secondary [    ]            Tertiary [    ]

**Section B: Effects of quarry operations on the communities**

(6) Do you agree with the view that the quarry operations have effect on the community?

Yes                       No

Give reasons for your answer .....

(7) If yes, what are some of the indicators of the effects of quarry operations in the communities? (You may tick more than one)

Unhygienic sanitation  Flying rocks

Water pollution  Ground vibration  dust pollution/generation

Noise pollution  Cracks in building

Others (specify) .....

(8) Are there any good quarry practices by the operators?

Yes                       No

(9) Give three examples to support your answer in question 8 above

a. ....

b. ....

c. ....

**Section C: Role of the communities in granting of permit to quarry operators**

(10) Are the communities involved in granting permits to quarry operators?

Yes     No

(11) If yes, give two ways in which the communities are involved

(a) .....

(b) .....

(12) How is the community represented?

By the Chief  By the Assemblyman  By Elected Individuals

By Family Heads  By Landlords/owners

(13) Is there anything you think can be done about the representation?

Yes  No

If yes, provide two ways,

(a) .....

(b) .....

**Section D: Procedures and stakeholders involved in granting permits**

(14a) Do you think there are procedures to be followed in granting of quarry permits?

Yes  No

(14b) Give reasons for your answer .....

.....

(15) How do you see the procedures for granting quarry permits?

Flexible  Rigid  Simple  Complex

(16) How beneficial are the procedures?

Ensures proper land acquisition

Prevents petty quarrels

Ensures acquisition of licence before operation

Make stakeholders aware of the operation

(17) Who are the stakeholders in granting of quarry permits?

.....

.....

(18) What role do the stakeholders play in the granting of quarry permits?

To ensure that there is reclamation after the work [ ]

To ensure that the site conforms with the zoning status [ ]

To ensure that illegality is eliminated or reduced [ ]

Ensures sanity in the quarry operation [ ]

**Section E: Challenges involved in granting quarry permits**

(19) What are the challenges involved in granting of quarry permits?

Selling of land in bits [ ] Changing of zoning status [ ]

Conflict of ownership [ ] Not involving the people in the permit process [ ] Payment of royalties not straight forward [ ]

(20) What measures can be put in place to overcome the challenges? The people should be involved in the permit process [ ] Payment of royalties should be made attractive and clear [ ] Re-zoning should be carefully done [ ] Others (Specify).....

(21) Give the roles you think the people can play in the permitting process

(1)

(2)

(3)

(4)

(22) Would it be beneficial to involve the people in the granting of quarry permits? [ ] Yes [ ] No

(23) Give reasons for your answer.

## APPENDIX B

### INTERVIEW SCHEDULE FOR KEY INFORMANTS

This interview has been designed to collect information on Social acceptance as the guideline for permitting quarries in the Sekondi-Takoradi Metropolis. The purpose of the study is to write a dissertation to the University of Cape Coast in partial fulfillment of the requirements for the award of a Master of Arts Degree in Environmental Management and Policy. Your cooperation as a respondent is highly solicited in making this research a success.

#### Section A: Background of respondents

(1) Type of key informant:

Assembly officials [ ]      Traditional Rulers [ ]      EPA officials [ ]  
Minerals Commission Officials [ ]      Quarry Operators [ ]      Others  
specify.....

(2) Sex      Male [ ]      Female [ ]

(3) Age (years).....

(4) Position in your institution .....

(5) Marital status:

Married [ ]      Single [ ]      Widow/widower [ ]      Divorced [ ]  
Separated [ ]      Others (specify) .....

(6) Educational Background

Middle school [ ]      JSS [ ]      'O' level / SSSCE [ ]

Post Secondary [ ]      Tertiary [ ]

Others (Specify) .....

**Section B: Problems of quarry in the Sekondi-Takoradi Metropolis**

(7) What are some of the problems of quarry your outfit sees in the metropolis? (You may tick more than one).

Unhygienic sanitation [ ] Ground vibration [ ]

Noise pollution [ ] Water pollution [ ] Dust pollution [ ]

Flying rocks [ ] Littering of roadside with aggregates for sale [ ]

Use of unqualified blast men [ ] Illegal acquisition of explosives [ ]

(8) Rank these problems in order of severity.

1. ....

2. ....

3. ....

4. ....

5. ....

(9) What are the causes of these environmental problems?

Ignorance/attitudinal [ ] Maximisation of profit [ ] Avoiding the law [ ] Survival [ ] Others (Specify) .....

(10) What do you understand by social acceptance?

.....  
.....

(11) What is the significance of social acceptance in the granting of quarry permits?

.....  
.....



**Section C: Procedures and stakeholders involved in granting permits**

(12) Do you know the procedures involved in granting of quarry permits?

Yes [ ] No [ ]

(13) If yes, mention them.

.....  
.....

(14) Who are the stakeholders in the granting of quarry permits?

.....  
.....

(15) What roles do play in the granting of quarry permit?

.....  
.....

**Section D: Challenges involved in granting quarry permits**

(16) Are there challenges in the granting of quarry permits? Yes [ ] No [ ]

(17) If yes, provide those challenges

- (a) .....
- (b) .....
- (c) .....
- (d) .....

(18) Can the challenges be eliminated or reduced?

Yes [ ] No [ ]

(19) If yes, provide the measures

(20) What role can the community play in the granting of quarry permits?

.....

## **APPENDIX C**

### **FOCUS GROUP DISCUSSION GUIDE**

- (1) Explanation of what a quarry is.
- (2) Explanation of the meaning of social acceptance.
- (3) Identification of the indicators of the effects of quarry operations on the communities.
- (4) Identification of forms/type of quarries operated in the communities.
- (5) Identification of reasons for undertaking quarry operations.
- (6) Reasons why children are involved in quarry operations.
- (7) Linkage between social acceptance and granting of permits to quarry operators
- (8) Identification of roles of the communities in the granting of permits to quarry operators.
- (9) Explanation some of the challenges that are involved in the granting of quarry permits
- (10) Identification of the extent to which the people themselves are responsible for the increase in quarry operations in the communities.
- (11) Suggestions of measures to reduce the impact of quarry operations on the communities.
- (12) Suggestion of measures to improve quarry operations in the communities.