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A socio-economic sustainability assessment of livelihoods from  
scrap metal collection in Freetown, Sierra Leone.

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## ***Abstract***

This study assess the socio-economic sustainability of the livelihoods of poor, marginalized and vulnerable people engaged in scrap metal collection in Freetown Sierra Leone, where scrap metal collection is observed to be one of the most attractive income generating activity for poor people. To accomplish this, semi-structured interviews and observations of the process of scrap metal collection were conducted as part of field work. Indicators that were deemed suitable for the assessment were selected based on the concept of poverty reduction of the United Nations Millennium Development Goals.

The result of the assessment indicated that scrap metal collection offers livelihood opportunities for poor people with an average monthly income greater than the minimum wage of workers in the formal employment sector. However, the economic benefit from scrap metal collection was found to be inadequate to access basic necessities for the social well-being of scrap metal collectors. Furthermore, issues of social security such as pension and insurance from work hazards were found to be lacking for those engaged in the activity of scrap metal collection.

In order to improve the livelihoods and make it more sustainable so as to lift the standard of living of people engaged in informal activities such as scrap metal collection, the implementation of multidimensional policies and regulations that will develop the capacities, choice, and diversity of livelihoods of scrap metal collectors is deemed vital. A bottom-up approach in the formulation of these policies and their successful implementation is deemed essential. The regulations should also be stringent to protect the exploitative tendencies of foreign investors under the guise of cheap labour.

*Keywords:* Livelihoods; scrap metal collectors; scrap metal collection; sustainability; socio-economic; assessment; scrap metal; well-being; Freetown; Sierra Leone.

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### List of Abbreviations and Acronyms

CO <sub>2</sub>	Carbon dioxide
GDP	Gross Domestic Product
GNP	Gross National Product
HMS <sub>1</sub>	High Metallic Standard One
HMS <sub>2</sub>	High Metallic Standard Two
HMS <sub>3</sub>	High Metallic Standard Three
ILO	International Labour Office
Kg	Kilogram
NASSIT	National Social Security and Insurance Trust
NGO	Non-Governmental Organization
SD	Sustainable Development
SLSMA	Sierra Leone Scrap Metal Association
SMC	Scrap Metal Collector
UN	United Nations
UNCSD	United Nations Commission for Sustainable development
UNDP	United Nations Development Programme
UNHDI	United Nations Human Development Index
UNMDG	United Nations Millennium Development Goals
US\$	United States Dollar
WCED	World Commission on Environment and Development

## **1. Introduction**

Sustainable livelihood is fundamental to the United Nations Millennium Development Goals (UNMDG) of eradicating poverty and hunger (UN, 2005). Sub-Saharan Africa stands out prominently among the regions of the world in terms of poverty (ibid). According to the UNMDG report of 2005, nearly 50% of Africa's population in 2001 lived on less than \$1 a day. The increased trend of poverty in Africa is alarming as shown by the 2008 United Nations Human Development Index (UNHDI) report, in which more than half of Sub-Saharan African countries are ranked at the bottom of the world (UN, 2008). Large populations of African counties are engaged in informal income generating activities. But the sustainability of their livelihoods from these activities that are expected to redeem them from poverty remains doubtful. Scrap metal collection is one such informal activity in Freetown, in which a large number of poor people depend on for their livelihoods.

Though scrap metal recycling can be regarded as an environmental friendly activity in terms of maximization of resource utilization, resource conservation, waste reduction and pollution prevention, albeit energy utilization and pollution from the recycling process cannot be completely avoided (Kaseva & Gupta, 1996). But the need to investigate the socio-economic benefits of scrap metal collection for recycling is deemed essential for poverty reduction and sustainable human development. But how secured and reliable are these socio-economic benefits for the livelihoods of poor people? The study therefore intends to resolve and clarify if scrap metal collection in Freetown can deliver secured and reliable livelihoods of improved standards of living for poor people engaged in the activity.

### **1.1. Objective and research questions**

The objective of this study is to analyze scrap metal collection in Freetown, so as to determine whether it is socio-economically sustainable. Socio-economic sustainability of livelihoods is explained here as secured and durable livelihoods that can lift people out of poverty. It will assess the sustainability of this activity using indicators that are deemed to be suitable based on the theoretical concept of the first goal of UNMDG of poverty

reduction and the International Labour Office's (ILO) description of what qualifies as decent work.

The specific research questions that will help reveal important findings during this study include:

1. Who are these people and why are they engaged in scrap metal collection?
2. How adequate are the incomes of scrap metal collectors (SMCs) to meet the needs of improved conditions of living and how secured and reliable are these incomes?
3. How can the livelihoods of poor people engaged in scrap metal collection be made more socio-economically sustainable?

## **1.2. Thesis structure**

The rest of section one describes the research design and strategy, the methods and materials used to conduct the study and the limitations of the research. Section two presents the background of the study area and explains how the activity of scrap metal collection is conducted in the study area. Section two further provides the theoretical basis of the study and states the environmental benefits of metal recycling and ended with a description of the indicators used for the sustainability assessment with the basis for their choice. Section three presents the results of the interviews. Section four focuses on the socio-economic sustainability assessment, while section five analyses and discusses the issues of the sustainability of the livelihoods of SMCs. Section six presents the conclusions and recommendations of the study and gave suggestions for further research.

## **1.3. Research design and strategy**

The research design is largely qualitative and of an exploratory case study strategy since it is focused on a detailed empirical investigation of the activities of a group of people within a given location (Bryman, 2008; Ragin, 1994; Yin, 2008). The use of “how”, “why” types of research questions are used as justifications for the choice of an exploratory case study research strategy for this study (Yin, 2003:5). In order to reveal the linkages and causalities of scrap metal collection, an in-depth research of a qualitative nature is deemed to be appropriate. An inductive approach of a research strategy is used to locate the relationship between the theories of human development, poverty reduction and livelihoods from scrap metal collection. However, the study will eventually suggest



how poverty reduction and human development from scrap metal collection could be achieved and this could be interpreted as an inductive approach of the research's contribution to the theories of poverty reduction and human development (Bryman, 2008).

The epistemological consideration that best describe the research strategy is that of interpretivism, that is distinctly within the phenomenon described by Von Wright (1971) as hermeneutics (Bryman, 2008). This entails a deviation in the procedure of conducting the research from that of natural science. This implies that there will be no laboratory experimentation or an adherence to laws of scientific nature in the conduct of this research. With this procedure, an understanding of the driving forces behind the actions and behaviors of SMCs is expected to be achieved and an interpretation of the results of the assessment of the study will constitute the theory of human development (Mikkelsen, 2005).

The ontological consideration of the research is that of constuctionism, which views social phenomena as been and continues to be constituted by social actors through interactions (Bryman, 2008). The researcher views social norms as being constituted by social actors. Therefore, to be able to make meanings from the explorations of this study, an interactive procedure through communication between the researcher and the researched will be employed (Kvale & Brinkmann, 2008). This entails the conduction of semi-structured interviews as part of the field work with scrap metal collectors, local buying agents, entrepreneurs and other stakeholders. An informal interactive session apart from the interviews was also employed. The interviews and interactive discussions with the stakeholders used as a communicative procedure can also be justified by Jürgen Habermas' communicative action as a means of understanding human behavior to solving problems (Callinicos, 2007).

Indicators that were deemed suitable were chosen for the socio-economic sustainability assessment base on the concept of UNMDG goal of eradicating extreme poverty and the ILO's concept of decent work. An analysis of the assessment in comparison with the income of the minimum wage employee of the formal employment sector was used.

#### **1.4. Methods and materials**

The methods used in this study to collect data were interviews using semi-structured questionnaire, informal discussions and observations in the study area. These are expected to give an understanding of the activity of SMCs, the reasons for their actions and the intended outcomes for the actions. However, a synthesis of the data to confirm the veracity of the facts relevant for the study in relation to the research questions from the bulk of the data collected was a fundamental goal of the field explorations. An iterative approach in the synthesis of the data was undertaken to discover similarities and linkages in the information collected. The field work was conducted within a period of four weeks from mid February to mid March. The period was chosen to conduct field work because it is the dry season in the study area during which scrap metal collection is very active.

Thirty-six respondents were interviewed using semi-structured questions. Five local buying agents and two entrepreneur business agents were also interviewed using semi-structured questions during the field work. An interaction with respondents that revealed vital information that was not part of interviews was realized as being very useful. In addition to the interactive sessions, observation of the activities of SMCs was used to verify the facts of the respondents. Interviews were conducted in local language Krio- a lingua-franca- which is the widely spoken language in the study area. Investigation of the minimum wage of an employee in the formal employment sector was also undertaken as a means for comparative analysis. A member of the executive and administrative union of Sierra Leone Scrap Metal Association (SLSMA) was very useful in facilitating the administration of the interviews since initial contact with a few of the SMCs proved fruitless. SMCs demanded a fee for the conduction of interviews for their valuable time in answering questions. . It was only the intervention of the union member that allowed the interviews to occur. However, the respondents and the SLSMA union executives were very eager to find out the benefits they could achieved from the study.

A literature review form part of the methods and the literature materials of the theoretical framework from international organizations such as United Nations Development Project (UNDP), UNMDG, World Bank, ILO, researched publications and peer reviewed

journals of similar studies conducted within the region and in other parts of the globe, previous thesis in sustainability assessment studies and books of issues related to the study were utilized. These materials form the basis of the arguments used in the assessment and in analyzing the findings of the study.

### **1.5. Scope and limitations**

The scope of this study is limited to assessing the socio-economic sustainability of the livelihoods of SMCs in the east of Freetown. Though it's a sustainability assessment, but the environmental and maybe institutional aspects were not undertaken. Also, environmental regulations relating to the Basel Convention are not dealt with in this study since the Sierra Leone has not ratified or a party to the convention. Environmental assessment of the industrial process of metal recycling and waste reduction from landfills were not undertaken in this study. However, the preconceived benefits of waste reduction and other environmental benefits were stated.

Three groups of SMCs were classified according to characteristics common to the group (Table 2). The groups are unskilled, skilled and those engaged in the activity as a secondary income generation. But the study only focuses on a single group (the unit of analysis) i.e. group 1, the unskilled. This is because the group was discovered to solely depend on scrap metal collection as the only source of income for their livelihoods. The assessment for the other two groups do not form part of this study since the two groups are either engaged in the activity as a secondary source of income or as a temporary measure for an income of livelihood. Furthermore, the assessment does not cover local buying agents who also solely depend on the buying of scrap metal as a source of income and the foreign business entrepreneurs. Investigations on the incomes of collectors was only limited to a single month per collector. Though this could not be a sufficient measure compared to incomes for a few more months say 3 months per collector. Incomes of say 3 consecutive months could have revealed the fluctuating pattern of incomes for a single collector. However, investigation of the adequacy of the minimum wage in the formal employment sector to meet the socio-economic necessities of living conditions was not undertaken.

## 2. Background

Freetown the capital of Sierra Leone is located on latitude 8.30°N and longitude 13.1°W (Macmillan Education, 2004). The city lies on the west coast of Africa and on western part of the country along the cost of the Atlantic Ocean of the Sierra Leone estuary (Encarta Encyclopedia Standard, 2006). The capital itself is divided into the western urban which is the main city and other peri-urban areas forming the western rural district. The main city is divided in to east, central and west (Figure 1). The eastern part of the city is further sub-divided into wards as East I, East II, and East III demarcated by blue lines, and it is in East I ward that this study was conducted (Figure 1).

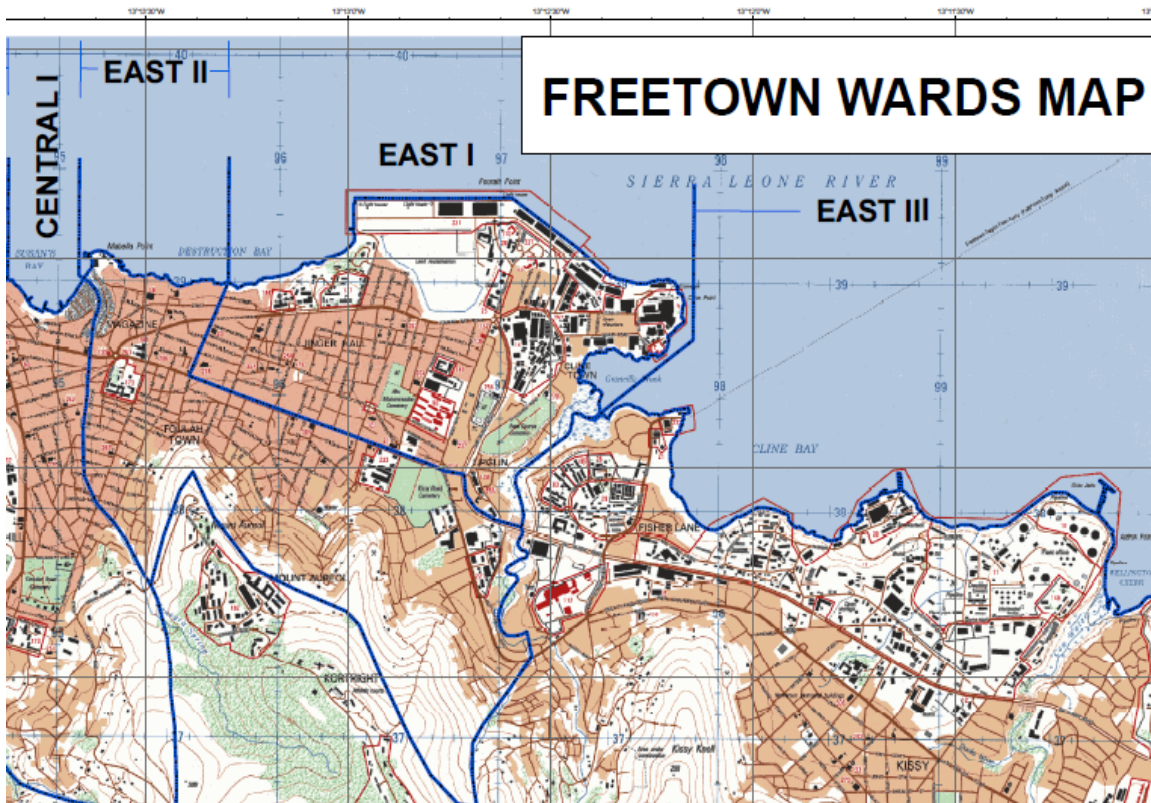


Figure 1: Figure 1 Map of Freetown showing study area; East I ward  
(Source: DACO/SLIS, 2008)

Key: ———— Boarder line showing sub-division of Freetown East.

The 2004 Population and Housing census conducted in the country discovered about 773,000 people in the city (Statistics Sierra Leone, n.d.), but observations of current population of the city can be realized to have doubled this number due to the rapid migrations of people from rural areas in search of livelihood opportunities and better conditions of living. Informal sector activities form the bulk of income generation for the livelihoods of most inhabitants of Freetown since formal sector employment opportunities are very minimal and keenly contested for (Braima et al., 2006).

Scrap metal collection has recently been observed to be one of the most attractive informal sector activities for most poor people especially youths inhabiting the eastern part of the city. The activity entails the collection of scrap metal from dumpsites, backyards, metal vessel wreckages and any other abandoned metal structures within the vicinity of the city. The collected scrap metals are transported using carts to local agencies within designated areas, where the collection is weighed and the collector is paid in cash. The local agencies in turn sell their wares to entrepreneurs. Six foreign entrepreneurs mostly of Indian origin are registered to buy scrap metals from the local agencies. The procured scrap metals from local agencies are placed in containers by the entrepreneurs and exported to India.

The average price per kilogram (kg) of scrap metal is US\$ 1.14<sup>1</sup>. The price per kg of scrap metal purely depends on the type of ferrous metal and the amount of corrosion on the scrap metal. The price is mostly determined by the local agents, based on visual inspection of the collection to determine the extent of corrosion. The types of ferrous metal are classified as HMS<sub>1</sub>, HMS<sub>2</sub> and HMS<sub>3</sub>. HMS<sub>1</sub> is regarded as the highest quality ferrous metal and hence has a higher price than HMS<sub>2</sub>, which subsequently has higher quality than HMS<sub>3</sub>. Non-ferrous metal such as aluminum and steel are also part of scrap metal collected, which are of higher price than the ferrous metal. Aluminum and steel scraps are sold at an average price of US\$ 1.64 per kg.

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<sup>1</sup> The official currency exchange rate during the months of February and March in which field studies were conducted is of 305 Sierra Leone Leones to 1 United States Dollars

There is no metal manufacturing industry in the country, therefore all metals are imported into Sierra Leone from industrialized nations. Some of these metals are imported into the country as second hand vehicles, sea vessels and other metallic structures, while only a few are imported as brand new. The usefulness of most second hand metal structures imported into the country such as vehicles and other electrical and electronic equipments is often very minimal, giving the practice of dumping derelict scrap materials into the country from industrialized countries. To protect the interest of their activity, a union has been formed by SMCs called the SLSMA. This union has a membership of 28,000 SMCs nationally.

### **2.1. Stakeholder identification**

The goal of identifying the stakeholders of scrap metal collection in Freetown is to recognize the players whose activities and contributions affect and can create a positive impact on the livelihoods SMCs. The participation of these stakeholders is deemed vital for a bottom-up-approach towards the improvement of the livelihoods of SMCs. The stakeholders and their stakes in the activity are listed below.

***SMCs:*** SMCs are the poor marginalized and vulnerable people engaged in scrap metal collection. They are marginalized because the state and other non-governmental organizations do not create any means of survival for this people. They are vulnerable because they are the worst affected and have no means of resisting economic hardship or natural disasters.

***SLSMA:*** SLSMA is a union formed by SMCs which protect the interest of their members in the conduct of scrap metal collection.

***Local buying agents:*** This is the group of people that directly interact with SMCs through the buying of scrap metals from SMCs. They serve as middle men between the entrepreneurs and SMCs.

***Entrepreneurs:*** These are the investors who buy scrap metal from local agents for export to India. They are mostly of Indian origin and their businesses are registered with the ministry of trade and industry.

***Ministry of trade and industry:*** This is the government department that has the authority to register business entities and where appropriate, regulate the conduct of business

activities in the country. Their stake in the activity is their regulative capacity to entrepreneurs.

***Freetown City Council:*** This is the municipal authority of the city of Freetown that has the responsibility of the collection and management of solid waste in the city. They manage the landfills and the vicinity of the city from where SMCs collect scrap metals. Their stake in the activity is borne by the reduction of solid waste in the city from scrap metal collection, and the management of landfills where some of the scrap metals are collected by SMCs.

***Non-governmental organizations (NGOs):*** Currently, results from field work indicated that there are no NGOs involved in the activity of SMCs. The role of NGOs in empowering the capacity of poor people's livelihoods is significant in poverty eradication and human development.

***Ministries of labour and social welfare:*** These are government departments. The ministry of labour has the responsibilities of facilitating employment and regulating the conduct of employment between employers and employees in both formal and informal sectors. The ministry of social welfare has the responsibility of facilitating the welfare needs of the citizens of the country. The stakes of both ministries in the activity is to facilitate the conduct of scrap metal collection to benefit SMCs and provide the necessary welfare services to SMCs.

## **2.2. Theoretical Basis**

The research has its bases on the theories of human development within the context of sustainable development, sustainable livelihoods and poverty reduction. The justifications for suitability of the research within these theoretical frameworks are separately analyzed in the following sub-sections.

### **2.2.1. Human development within the context of sustainable development**

Sustainable development (SD) or sustainability has its significance embedded in intergenerational human development (Bell & Morse, 2003). The concept was borne from the notion of ensuring human development, while maintaining the planetary life support systems by the United Nations World Commission on Environment and Development in 1987 (WCED, 1987). The report of the commission titled our "common

future” highlighted the significance of improving the living conditions of societies through the use of natural resources and ensuring that future generations will have similar opportunities to utilize these resources and enjoy the same benefits (ibid).The concept however professes upholding the three fundamental pillars (economic, environmental and social) regarding the issues of continuity and equity among current and future generations. Considering the need for the south to catch up with developments already achieved by the north, SD served as a framework of strategies on which to base developmental policies for the achievement of such developments. The developments intended within this study are not only focused on the growth of the economies<sup>2</sup> of nations of the south, but developments that will reflect improved living conditions of the people of the countries of the south. In order to achieve sustainable human development aspirations as enshrined in SD and get African countries from the bottom of the UNHDI, the growth of African economies should be targeted towards improving the standards of living of its people. The exploration contained in this study is conceived to be within the notion of human development through improved livelihoods. This is because this study aims to provide information that will be useful for the enhancement of policies that will improve opportunities for the capacities of people to earn better incomes for their livelihoods and eventually improve their standards of living.

This research is within the framework of SD with the justification of the need to investigate if the economic benefit of scrap metal collection is adequate to provide the social needs of improved conditions of living for poor people. Improve standards of living is considered here as the main focus of human development, which is also the central theme of SD. Therefore, activities that renders environmental benefits while at the same time ensuring human development can be evaluated as a win-win scenario for the environment and socio-economic development of people. Furthermore, the question of investigating the quality of people’s lives engaged in scrap metal collection and its

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<sup>2</sup> Economic growth of countries of the south measured in GDP or GNP per head especially in Africa has been noted not to reflect on the standard of living of the people especially in Africa (Anand and Sen, 2000). This is explained by (ibid) to mean that the economic growths of these countries are not equally distributed to the population of the countries. The growth is only reflected on a few individuals thereby widening the inequality gap between rich and poor in these countries (ibid).



continuity i.e. over intergenerational time scale, which is a significant issue of SD, justifies the theoretical basis of the study within the framework of SD.

### **2.2.2. Sustainable livelihoods**

The significance of the theory of sustainable livelihood and its basis for this study is borne by the desire to empower the capacity of people to earn incomes that meets their current and future economic and social needs and minimizes their vulnerability to external stresses and shocks (Ashley & Carney, 1999). According to Arce (2003), the theory of livelihood is not only limited to income generation but also entails the social welfare of people. It is therefore essential to put into context the social well-being of people into the concept of sustainable livelihood. The desire to enhance the sustainability of livelihoods for poor people in developing countries has attracted the attention of many international organizations (Toner & Franks, 2006). But according to Toner & Franks' (2006) citation of Bond & Hulme, (1999), most of the approaches employed to enhance sustainable livelihoods failed because of their top down nature (Toner & Franks, 2006). It is very vital for any effective intervention in the enhancement of the sustainability of livelihoods to allow the beneficiaries to make the choice of the nature of the intervention (ibid).

Also, according to Farrington et al. (1999), sustainable livelihood approaches should include a central focus on people and a holistic approach. The central focus on people entails pro-poor strategies that include analyzing the dynamics of livelihoods, rendering support and allowing the total participation of beneficiaries. It should also entail bringing together the various policies and institutional settings that exist with the intent being to influence and harmonize the differing arrangements in furthering a pro-poor agenda (Farrington et al., 1999). The holistic approach involves eradication of the marginalization of poor people, understanding the complexity of the relationship of their influences, recognition of various institutional stakeholders, encouragement and promotion of a diversity of livelihood strategies adopted by people (ibid).

A thrilling issue specifically with regards to informal activities such as scrap metal collection is how should livelihoods from this activity be made sustainable? Several

issues can be brought into the focus of livelihoods for a meaningful discussion. These issues include the economic, social and institutional concepts of sustainability, and issues of intra and inter-generational equity.

The economic sustainability of livelihoods based on scrap metal collection deals with the adequacy (or inadequacy) of the economic benefits generated from the activity required to meet improved standards of living for those engaged in it as prescribed by the ILO conditions of decent work (ILO, n.d.). The quality of decent work described by ILO is one that ensures job security, reliability and social protection, while the incomes should be capable of lifting workers from poverty (Rogers, 2007). It is apparent that the purpose of poor people's engagement in scrap metal collection is to realize economic benefit that will lift them out of poverty. The failure of the income to meet improved standards of living can be regarded as an unsustainable livelihood activity. Furthermore, the continuity of the economic benefit should be seen in the long term perspective, specifically as long as individuals are engaged in the activity.

The social sustainability of livelihood with respect to SMCs entails issues such as social security of the job, and other social services relevant for improved standards of living for SMCs. A livelihood activity that enables an individual to afford access to the above social facilities can be regarded as sustainable. Intragenerational equity issues on sustainable livelihoods concerns equality in income distribution between the various stakeholders in the trade such as collectors, agents and entrepreneurs in the scrap metal collection for recycling trade. For the sustainability of the livelihoods of SMCs, inequality in the incomes of local agencies, SMCs and entrepreneurs should be minimized so as to avoid the possibility of the exploitation of one stakeholder by the other. The intergenerational sustainability should in the same sense ensure that future generations' opportunities of earning incomes from the scrap metal collection should not be disadvantaged by current generations.

The sustainability of livelihoods of people cannot be guaranteed if institutional capacity required to design and implement policies and regulations in the interest of the people is lacking. According to Toner and Franks (2006), the formulation and implementation of

policies and regulations determines the level of benefits achieved in sustaining livelihoods.

### **2.2.3. Poverty reduction as the first goal of the Millennium declaration and its relation to human development**

Poverty reduction is a key challenge for human development confronting many developing nations of the globe (Handley et al., 2009; McNeill & StClair, 2009). The desire of the UNDP to assist countries tackles poverty and hunger led to the first goal of the UNMDG declaration in a United Nations summit in 2000. Poverty has also been posited as an ethical topic in human development issues (McNeill and St. Clair, 2009). The essence of poverty reduction for developing nations is geared towards improving the quality of peoples lives on which the fundamental significance of SD and the UNMDG are built. The concern for improving the quality of peoples lives hinges on human dignity and the right to live. Although the concept of sustainability impinges on intergenerational equity, the question of intragenerational equity deserves primary attention if intergenerational equity is to succeed (Anand & Sen, 2000). The challenging issue of eradicating poverty by creating equality in the living conditions of people globally therefore has to be taken as a vital component of sustainability (ibid). However, the causes for poverty have several linkages to socio-economic issues, which cannot be dissociated from sustainability.

The study finds its theoretical basis within the concept of poverty reduction for the reason that the group of people under investigation is perceived to be poor and disadvantaged. The findings and recommendations of this study are expected to contribute towards the development of solutions for poverty reduction and an achievement of the first goal of the UNMDG.

### **2.3. Environmental benefits of scrap metal recycling**

The environmental benefits of recycling can be based on a number of issues. Within the context of scrap metal recycling, the beneficial issues discussed here are resource conservation and efficiency of resources use, solid waste management strategy, energy conservation and pollution prevention of soil and groundwater bodies.

The recycling of scrap metals for the production of new metals conserves virgin ores (Kaseva & Gupta, 1996; Langenhoven & Dyssel, 2007) which is known to be finite and non-renewable (Gordon et al., 2006; Gordon et al., 2007; Richards, 2006). Apart from the environmental damage and the pollution of soil and groundwater bodies caused by mining activities of virgin ores, the recycling of scrap metal also prevents the depletion of the finite ores (Kaseva & Gupta, 1996) and ensures efficiency in the maximum utilization of non-renewable resources. According to Kaseva and Gupta (1996) citation of Environmental Sanitation Review of 1984, the production process of steel from scrap steel recycling is realized to use 40% less water than the production process from virgin ores.

Scrap metal collection from landfills and the surrounding environment for recycling can be realized as a more sustainable approach to municipal solid waste management (Kaseva & Gupta, 1996). This is due to the fact that scrap metals can be bulky and will occupy very large areas of landfills. The collection of the scraps therefore reduces the amount of waste in landfills thereby reducing the amount of land required for waste disposal (ibid). The retrieval of scrap metals from landfills also prevents the pollution of soil and groundwater bodies from the decomposition of the metals in the soil. Finally, according to Johnson et al. (2008), the production of stainless steel from the recycling of scrap stainless steel is realized to save 67% of energy usage and 70% reduction in CO<sub>2</sub> emission if all materials used in the production process were all scrap stainless steel rather than virgin ores.

#### **2.4. Indicators**

The indicators used for the social and economic sustainability assessment are stated and described in this section with the justification for the choice of their selection.

#### **2.5. Basis for the choice of indicators**

The use of indicators of for example UNCSO for sustainability assessment of a national character may not be deemed suitable for an assessment of a subset of the population engaged in a single activity. Therefore, this assessment entails the identification and definition of indicators considered suitable based on concepts of the UNMDG goal of poverty reduction, the ILOs definition of decent work, the availability of data and the

appropriateness of the indicators to assess the sustainability of livelihoods as defined within this context. However, efforts have been made to ensure that these indicators are meaningful and can be interpreted to give an indication of how durable and secured are the livelihoods of people engaged in scrap metal collection. The justification for the access to social services indicators is linked to the concept of human well-being and human development (Prescott-Allen, 2001).

## **2.6. Description of assessment indicators**

Two indicators of income sufficiency and income reliability are used to conduct the economic assessment. Two sub-groups of indicators are used for the assessment of the social pillar of sustainability. The two sub-groups are working conditions, and access to social services. The sub-group of indicators identified as working condition consists of four indicators. These are occupational hazards, employment security, social security and daily number of hours of work. While the second sub-group of indicators called access to social services consist of three indicators. These are access to clean water, access to electricity and access to medical services.

Table 1 summarizes indicators and their subgroups. The first column of the table consist of the main theme of indicators called economic and social, the second column consist of the sub-groups of indicators called income, working conditions and access to social services, while the final column consist of the indicators.

**Table 1: Summary of indicators**

<b>Main Theme</b>	<b>Indicator sub-group</b>	<b>Indicator</b>
Economic	Income	1. Income sufficiency
		2. Income reliability
Social	1. Working conditions	1. Occupational hazards 2. Employment security 3. Social security 4. Daily number of hours of work
	2. Access to social services	1. Access to clean water 2. Access to electricity 3. Access to medical 4. Access to good shelter

A total of nine indicators are used in assessing the socio-economic sustainability of livelihoods from scrap metal collection. The assessment is geared towards ensuring that livelihoods from scrap metal collection can become a strategy of eradicating poverty which is a fundamental goal of UNMDG and ensuring that the job is decent and within the framework of ILO's description of decent work.

### **2.6.1. Economic indicators**

Two indicators are identified for the economic sustainability assessment. The indicator of income sufficiency is geared towards evaluating the value of the monthly income of SMCs to meet the delivery of their basic needs and services. The indicator of income reliability is used to assess the reliability of a secured monthly income from scrap metal collection up to the retirement age of SMCs. This is at age 60 years (the retirement age of a formal sector employee). This is in comparison with the minimum wage employee in the formal employment sector. The income reliability indicator is chosen to assess if the income from scrap metal collection can be relied on as a means of livelihood for the entire working life of a SMC. Both economic indicators assesses if incomes of SMCs can lift them out of poverty and ensure human development.

### **2.6.2. Social indicators**

Working conditions and access to social services are the two sub-groups of social indicators selected for the sustainability assessment. Four indicators under the sub-group indicator of working conditions are chosen. These are occupational hazards, employment security, social security and daily number of hours of work.

The occupational hazard indicator assesses the physical risk of scrap metal collection within the working environment. The choice of this indicator is to give an indication of the working environment of scrap metal collection. Employment security indicator assesses how secured is the job of a SMC as compared to formal sector employment. The social security indicator assesses social safety net of the job that SMCs received in the form of pension after retiring from active work and insurance benefits from accidents during working hours. This indicator is geared towards the social welfare of SMCs at old age and in the event of an accident at work. The daily number of working hours indicator

assesses the daily amount of working hours input into scrap metal collection in comparison to the daily number of working hours of a formal sector employee earning a minimum wage. The rationale for this indicator is based on finding out whether SMCs spend more time at work than the minimum wage employee in the formal sector. The working conditions sub-group of indicators assesses if the work of SMCs are within the description of ILO's conditions of decent work.

The sub-group of indicators named access to social services includes access to clean water, access to electricity, and access to medical services. All three indicators assess the capability of the income of a scrap metal collector to access the basic services that are deemed necessary for improved standards of living for poor people. The rationale of the choice of the indicator is to assess the living conditions of SMCs so as to evaluate if the incomes from scrap metal collection offer good conditions of living. Some of these indicators are part of the indicators for human well-being (Prescott-Allen, 2001). The sub-group of indicators of access to social services assesses if the livelihoods of SMCs are in line with the conditions of human well-being.

### 3. Results of interviews

The results of the interviews conducted during the field work are presented in this section.

#### 3.1 Classification of respondents into groups

To gain an insight into the diverse characteristics of individuals engaged in scrap metal collection, the respondents are categorized into three groups based on similar characteristics prevalent to the group (Table 2).

**Table 2: Categories of respondents**

Item	Groups	Number of respondents
1	Unskilled	21
2	Skilled	9
3	Scrap metal collection as a secondary activity	6
	TOTAL	36

The groups are classified into skilled, unskilled and those engaged in scrap metal collection as a secondary source of livelihood activity. The second column of the table shows the groups, while the third column shows the number of respondents in each group.

The main reason given by the unskilled group for engaging in scrap metal collection is for a source of income for their living conditions. However, 63% of the unskilled group gave an indication of their willingness to be trained for better jobs, but fail to indicate their willingness to fund such training. Their willingness to undertake such training is based on the provision of funds for the training to be borne by another party. The remaining 37% of the unskilled group maintained that scrap collection is their career and they will only abandon it if there are no more metal scraps available to be collected. The majority in this unskilled group have been collecting scrap for more than 5 years.

The second group of SMCs as shown in Table 2 is the skilled group. This group of individuals is skilled in various disciplines such as masonry, carpentry and automobile mechanics. Sixty-seven percent of respondents in this group are educated (see Table 3) but do not have the opportunity to start a self employment business in their various disciplines and are searching for employment. The main reason of the skilled group involvement in scrap collection is the unavailability of jobs in their various disciplines. However, all of them maintained that scrap collection is a transit activity to sustain their living conditions while searching for jobs or a capital to start their own business in their skilled disciplines. However, 59% of those in this group have been collecting scrap metals for more than 1 year.

The third group of scrap collectors shown in Table 2 engage themselves in scrap metal collection as a secondary income generating activity. The main occupations of this group of SMCs include automobile mechanics, welders and labourers involved in buildings construction work. The automobile mechanics and welders have registered business entities locally known as “Automobile Service Garage”. Some of them achieved tertiary education in polytechnic institutions, while others are uneducated but learn their skills in fixing and servicing of automobiles as apprentice to skill individuals in garages. Automobile mechanics and welders are individuals or groups of individuals engaged in



the service and maintenance of automobiles. Their work involves the servicing and fixing of broken-down engines and welding of parts of the bodies of vehicles. Due to their work, the abundance of scrap metals from the engines of broken down automobiles are largely within their proximity. This group view income from scrap collection as extra earning. Labourers of building construction works are also mostly unskilled and uneducated but are engaged by building construction companies or individuals constructing a building to do manual labour work. Their work is mostly the manual transportation of materials from one point to the other within construction sites. Labourers are classified within the formal employment sector as minimum wage employees. The incomes of this group of people are complemented by scrap metal collection to meet the socio-economic needs of the living conditions of their households. Seventy-six percent of the labourers are employed by construction companies and have social security numbers as registered members of the national social security scheme. Only 54% of the self employed respondents from automobile garages have social security numbers.

### 3.2 Age distribution of respondents

The age distributions of SMCs are classified into four age cohorts shown in Figure 2. It is realized that the highest percentage of respondents are within the age groups of 16-25 and 26-35 which are 41% and 39% respectively. The lowest percentage of respondents is in the age cohort of Under 16 years old, which is 9%. Only about 6% of respondents were women (not indicated in Figure 2). The gender disparity in the activity of scrap metal collection which largely favours men may not be unconnected with the fact that men are mostly regarded as bread winners of households in these communities. This was also discovered in a similar study in Botswana (Rankokwane & Gwebu, 2006).

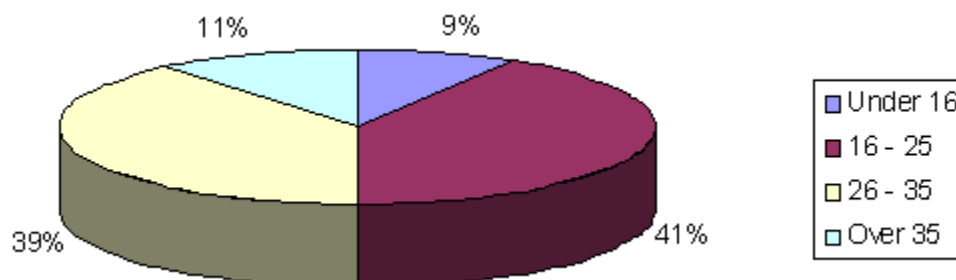


Figure 2: Figure 2 Age distribution of scrap metal collectors.

### **3.3 Incomes of SMCs**

The monthly incomes of SMCs range from US\$33 to US\$263. But the average monthly income is estimated as US\$82. The large range in the monthly income may be attributable to several reasons. Firstly, the activity is a form of self employment, meaning that it depends on the amount of person-hours<sup>3</sup> dedicated to the collection. Secondly, the earnings from individual collection depend on the quality of the scrap, which is further determined by the type of ferrous and non ferrous scrap collected and the amount of visual corrosion estimated to be on the collection. The determination of the amount of corrosion on scrap metal which is conducted by local buying agents to determine the price of scrap metal may also be a factor. This is because local buying agents' judgments on the amount of corrosion may be biased and may result to a lower value than the actual worth scrap metals collected by a SMC.

### **3.4 Risks and hazards of work**

The risk or workplace hazards outlined by all respondents in scrap metal collection vary. Fifty-three percent of respondents indicated injuries due to body cuts as being the main risk during the collection process. Thirty-eight percent mentioned body pain injuries. The remaining 9% did not indicate any risk during the collection process.

Obstacles or problems encountered during the collection process and in the activity also vary. About 45% indicated price fluctuations as a major obstacle to the activity. Thirty percent mentioned the transportation of collected scraps to local agents as the major obstacle in the activity, 21% mentioned harassment from police, while 4% said they don't have any problems.

The general characteristics of respondents are given in Table 3.

### **3.5 General characteristics of respondents**

The general characteristics and percentages of respondents in terms gender, marital status, number of household dependents, level of education, employment status, those having adequate housing facilities and can access the basic social services needs, and the number of years of engagement in scrap metal collection is shown in Table 3. The table consists of three columns of various characteristics, the categories of the characteristics

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<sup>3</sup> Person-hour is used here to mean the amount of hours of labour input to an activity.

and the percentage respondents in each category. The table shows that most respondents are male. Forty-four percent of respondents are married, 39% are single and only 17% are widowed or divorced. Twenty-two percent of respondents have no dependants, 50% have household dependants between 1 to 2 persons, 17% have household dependents of 3 to 4 persons and 11% have more than 4 persons as dependents.

The general characteristics of respondents are outlined in Table 3 below.

**Table 3: General Characteristics of respondents**

<b>Variable characteristics</b>	<b>Category</b>	<b>Respondents (%)</b>
Gender	Male	94
	Female	6
Marital status	Single	39
	Married	44
	Divorced/widowed	17
No. of dependants	None	22
	1 – 2	50
	3 – 4	17
	More than 4	11
Level of Education	Uneducated	58
	Primary	25
	Secondary	14
	Tertiary	3
Employment status	Employed (self employment excluding SMC)	17
	Unemployed	83
Shelter conditions	Formal shelter	19
	Informal shelter	81
Access to social services	Access to pipe borne water	19
	Access to Electricity	19
	Access to medical services	21
No. of years of scrap metal collection	Less than 1	44
	1 – 4	33
	5 and above	23

Fifty-eight percent of respondents are uneducated, 25% of respondents achieved primary education, and 14% achieved secondary education, while only 3% achieved tertiary education from polytechnic institutions. Seventeen percent of respondents are engaged in other income generating activities excluding scrap metal collection, while the remaining 83% are only engaged in scrap metal collection during the time of conducting the interviews. Only 19% of respondents live in formal shelter conditions with electricity and pipe borne water facilities. The remaining 81% of respondents live in informal shelter without electricity and pipe borne water facilities. Only 21% of respondents indicated their access to medical services while the remaining 79% responded that they cannot afford the cost of formal medical services. Forty-four percent of respondents have been engaged on scrap metal collection for less than a year, 33% have been collecting scrap metals between 1 to 4 years, while the remaining 23% have been engaged on scrap metal collection for over 5 years.

## **4. Results of assessment**

The results of the sustainability assessment of the interviews and observations from field work using the selected indicators are given in this section.

### **4.1. Economic sustainability assessment**

#### **4.1.1 Income sufficiency**

The interviews revealed that the average monthly income of SMCs was US\$ 82. The average monthly income is found to be more than the minimum wage of US\$55 for a formal sector employee such as a labourer employed in the construction industry. But this income does not reflect an improved standard of living on SMCs or lift them out of poverty. Noting that the US\$ 82 is an average figure, interviews revealed that some SMCs realized less than this figure while others realized incomes more than the average figure in a month. Further interactions with SMCs revealed that the monthly incomes generated are not fixed, but fluctuate depending on the effort of SMCs and the fluctuating price of scrap metal. However, findings from interviews revealed that 54% of respondents indicate the insufficiency of their incomes to meet the basic necessities of their living conditions. This fact needed further verification by the observation of living conditions since the responses may be borne by the desire of SMCs to solicit financial

assistance from the researcher, or the hope of soliciting other supports from the findings of the study. This is because SMCs are full of expectations from strangers believed to be working for charities and non-governmental organizations, and the purpose of the interviews might have been misunderstood; even though an introduction to the purpose of this study as being purely academic was explained to them.

#### **4.1.2 Income reliability**

The assessment of the income reliability of SMCs is discovered to be unreliable in comparison with the minimum wage employee in the formal sector who is assured of a monthly salary as a result of their work. Factors responsible for the unreliability of incomes are scrap metal price fluctuations and the risk of exhaustion of scrap metals within the vicinity of landfills and backyards in the near future. The fluctuating price of scrap metal leaves SMCs with a sense of income insecurity in a SMC. It is difficult for a SMC to determine an income of scrap metal collected now, in comparison to a previous and similar collection due to price fluctuations. Furthermore, the potential of exhausting scrap metals within the vicinity of the city creates a worrisome picture as to the continuation of the activity. Though the use of metal materials cannot be said to be short lived, but it is also vital to note that these items may have a life span which may range between 10-35 years before their end of life. One can possibly assume that most of the scrap metals being collected now may have been accumulating for more than 30 years before the business of scrap metal collection for recycling was introduced in the country.

### **4.2 Social aspects**

#### **4.2.1 Working Conditions**

##### **4.2.1.1 Occupational hazards**

The results of the interview conducted during the study revealed that scrap metal collection poses a threat to the health of collectors from bodily cuts and pains and an exposure to disease contamination. The activity is largely conducted with no protective clothing such as boots and gloves. In some instances cutting of scraps from onshore abandoned vessels is done with sharp equipments with no protective clothing. Eighty-three percent of respondents complained of ailment such as body pains, while 67% of respondents showed body cuts due to the activity. The activity exposes SMCs to the risk

of body cuts and tetanus disease as results of wounds from corroded scrap metals without medical and work hazards insurance. Secondly, SMCs complained of harassment from the police and other state authorities with allegations being levied against them for thefts of contra-band<sup>4</sup> scrap metals. This leaves a feeling of insecurity in the face of state security and a sense of being discriminated at the hands of the police for trying to earn their livelihoods.

#### **4.2.1.2 Employment security**

Employment security relates to how secured is the job of a SMC. The activity does offer a livelihood opportunity, the security of which depends on future demand for metal recycling, and scrap metal availability. However, considering that ores are non-renewable or finite resources (Gordon et al., 2007; Richards, 2006), the future opportunity of scrap metal collection largely depends on the need for metal recycling depending on whether the collection process for scrap metal remains the same. The realization of the environmental benefits of metal recycling and the assumed potential benefits it may render to the metal industry may drive the need for emphasis on recycling. Also, the non-renewable nature of the resources which warrants the fear of depletion and sustainability demands of the resource coupled with environmental regulations may be the main drivers to the recycling potential. The potentials for metal recycling now and in the future to meet the increasing demands for metals hold the prospect for the creation of livelihoods opportunities through the collection of scrap metals.

However, it is also likely that an upsurge of environmental regulations or the intensification of scrap metal recycling in industrialized countries that may limit the dumping of second hand metal materials to developing countries such as Sierra Leone may thereby reduce the quantity of scrap metals availability within the vicinity of Freetown. The intensification of metal recycling could be borne by virgin resource scarcity and economic reasons if metal recycling is proven to be economically better than the exploitation of virgin ores for the production of new metal materials.

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<sup>4</sup> Contra-band scrap metals are properties and installations such as broken down electrical transformers and abandoned railway lines of the state or owned by state agencies which are declared illegal to be collected by scavengers. The fact of these installations not been in use and abandoned in areas not protected attracts SMCs.

#### **4.2.1.3 Social security**

The interviews revealed that all respondents in the unskilled and skilled groups (Table 2) are not enrolled and do not contribute to the National Social Security and Insurance Trust (NASSIT) scheme. The scheme is of national character and a state entity that enroll workers in both the formal and informal employment sectors. The scheme according to its mission statement guarantees financial benefits to employees at retirement and for accidents at work (NASSIT, n.d.). The scheme gives out pension to beneficiaries after retirement from active services and insures employees from working accidents. Only 54% of respondents doing scrap metal collection as secondary sources of income have social security numbers. This leaves 92% of respondents not having social security from work and all respondents in the unskilled group (the focus group of the study). The lack of social security for the majority of SMCs and especially the focus group of this study leaves SMCs vulnerable at old age. Except from the savings or investment of SMCs which was not investigated, there was no evidence of any form of social security for the majority engaged in the activity of scrap metal collection.

#### **4.2.1.4 Number of working hours**

The time of work of SMCs is purely on individual discretion, though the need for higher income is a paramount driver for more number of hours to be put into the activity. SMCs spend an average of 9 hours of work daily. There is no specific time for lunch break from work by some SMCs during working time. The reason for this was indicated as the need to collect as much scrap metals as possible so as to increase the chances of getting more money. However, a comparison of formal sector employment working hours of 7 hours per day for a minimum wage worker revealed that SMCs inputs more time into their work than do formal sector workers. The number of hours of work is sometimes not reflected in the earning of SMCs since the earnings are largely influenced by the quality of scrap metal collected. This implies that the productivity of SMCs in relation to the amount of time spent on scrap metal collection is low.

## **4.2.2 Access to social services**

### **4.2.2.1 Access to clean water**

Eighty-one percent of respondent do not have access to piped borne water within their residences (see Table 3). They had to fetch pipe borne water from nearby neighborhoods or public piped water facilities<sup>5</sup>. This is because the respondents live in informal sector housing facilities that lack pipe borne water facilities. The provision of pipe water facilities is only limited to formal residential infrastructures since these are planed facilities and have the necessary documentation for their existent. Informal housing structures are mostly not registered with the ministry of housing and are not recognized to have legal status of existence. They may be on land areas that are either public property, inhabitable areas, or on lands that are not owned by the occupants. The provision of piped borne water facility to these structures is problematic since they do not have legal documentation. These are the housing facilities that are very cheap and are affordable by SMCs since the materials used to construct them are either from used corrugated iron sheets, sticks, used timber etc. The lack of access to clean water may pose problems of proper hygiene and sanitation that leads to poor health conditions of SMCs.

### **4.2.2.2 Access to electricity**

Eighty-one percent of respondents do not have access to electricity for the same reasons of informal housing conditions. However, although all respondents indicated the desire to have electricity in their dwellings, the question of the ability to afford electricity bills from the meager earning was a stumbling question for the majority of the respondents. It is however evident that the incomes may not be adequate to afford electricity bills. It is also important to note that the provision of electricity to informal dwellings may not be feasible since the legality of these structures is questionable. Therefore, the desire to use electricity goes with other financial commitments such as water bills and formal housing rents. These facilities are not within the financial capability of SMCs since their incomes from scrap metal collection are not sufficient to afford formal housing facilities as reflected by their current shelter conditions. The lack of electricity has negative

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<sup>5</sup> Public pipe water facilities are installations of the Freetown City Council, the municipal authority that manages the cleaning of the city and solid waste. Water from these public facilities is not paid for by Freetown inhabitants and are located within public areas.



implications on food preservation in a refrigerator and other home facilities of entertainments that needs electricity for its operation.

#### 4.2.2.3 Access to medical services

Seventy-nine percent of respondents do not have to access formal medical services (see Table 3) and so resort to traditional medicines or unqualified medical persons<sup>6</sup> for cheap medical services. There is no form of medical insurance for SMCs and no form of any medical service from the state. Irrespective of the exposure of SMCs to disease contamination, the most viable medical option is the purchase of drugs from street vendors or the use of traditional medicines during the course of an illness. The lack of access to formal medical services risks the health and lives of SMCs who seek medical services from unqualified medical persons. However, the cost of the services from these unqualified medical practitioners is very less than the formal medical services which attract SMCs since the cost are affordable.

#### 4.2.2.4 Access to formal shelter

Eighty-one percent of respondents live in housing facilities without electricity and piped borne water infrastructures within their houses (see Table 3). They live in shanty dwellings located in public places, inhabitable areas and in dwellings constructed on lands that are legally questionable. The reason of the inability to afford the rent for decent housing causes SMCs to reside in shanty dwellings some of which are constructed by them on either rented plots of land from people claiming ownership of these lands or vacant inhabitable plots of land or in rented shanty dwellings. The sanitary conditions in most of these dwellings are very deplorable. The rest of the 19% of respondents have access to improved housing conditions. These are mostly SMCs with other sources of income, who are engaged in scrap metal collection as a secondary income generating activity (group 3 of Table 2).

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<sup>6</sup> Unqualified medical persons are individuals who are not trained but engaged in the sale of drugs on the street and can prescribed medication for illness.

## **5. Analysis and discussion**

This section analyzes and discusses the results of the assessment and other relevant issues to the livelihoods of SMCs. The section further discusses how the livelihoods of SMCs can be made more socio-economically sustainable.

### **5.1 Prospects for future livelihoods from scrap metal collection**

In analyzing the livelihoods of people engaged in scrap metal collection, the need to locate the future demand for metal recycling deserves significant attention. Gordon et al., (2006) highlighted that the current stock of ores in the earth's crust cannot meet the necessitated increased future demands of metals for developmental and other services. They further indicate that unless the services provided by metals are substituted by other materials which also have cost and appropriate technological implications, the need for the various services of metal will continue to rise with increasing technological growth of development in developed and developing countries (ibid). According to Gordon et al. (2006), the future increase in the demand of metals which cannot be met by the current estimated stock of non-renewable virgin ores deposits will only be met by increased recycling and efficient use of the current stock of metals. The facts highlighted by Gordon et al. (2006) leaves an indelible ink of hope on the potentials of the future of scrap metal recycling, and unless procedures of scrap collection are altered, the current collection method will continue to offer livelihood opportunities for those engaged in scrap metal collection. However, if the emphasis placed on the recycling of metals is to continue, then it can be assumed that scrap metal collection will continue to offer livelihood opportunities to those engaged in this activity provided the method of scrap metal recovery does not change.

On the other hand, the fear of exhausting scrap metals within the vicinity of landfills and backyards also pose a threat to the long term opportunities for the continuation of this activity. Though an upsurge of metal usage is indicated by Gordon et al., (2006), which also has the potential of increasing the opportunities of scrap metal deposition at end of life, my field observation on the current rapid spate of scrap metal collection within the short term perspective will leave landfills and backyards clean of scrap metals. The envisage scarcity of scrap metal within short term perspectives may lead to an increase in

the price of scrap metal in Freetown, which will eventually result in owners of scrap metals conveying the scrap metals to the local agents themselves and hence depriving SMCs of the opportunity to earn an income from scrap metal collection.

## **5.2 Price of scrap metal**

The paramount driving force behind scrap metal collection is the lucrative income opportunity that is expected from the activity which is largely influenced by the price per kg of scrap metal, which is determined by the world metal market. However, the current trend of price fluctuations is very worrying, limiting the capacity of the livelihoods of SMCs. Gordon et al. (2006) indicated the factors of current metal demand being met by current stock of ores deposit and the technological advancement in the mining of the ores as limiting the price of metals to reflect its non-renewable nature. If that is the case, then the current trends of price fluctuations cannot be dissociated from the perceived future scarcity, the current financial crises (which may have resulted to a drop in the use of metal materials) or the market forces of demand and supply created by the mining and metal industry. The effects of these factors on the price of metals have very serious implications on the livelihoods of SMCs since low incomes from the activity do not contribute to ameliorate the livelihoods status of the affairs of SMCs.

Richards (2006) argue that the finite nature of non-renewable resources such as metals should be reflected on the cost of the raw materials and to internalize the cost of environmental damage caused by the extraction and manufacturing of metals, so that recycling options will be given preference. Though he also highlighted the fact that while the rise in the demand for metals is ever increasing the price has remained constant and it does not reflect the finite nature of the resource and the depletion that is occurring (ibid).

Both Gordon et al (2006) and Richards (2006) arguments present very strong points for the use of economic sanctions to managed non-renewable resource depletion and environmental mitigation, so as to pave a way for more resource conservation and efficiency of material utilization. But their arguments most importantly indicated the need for an increase in the price of metals to reflect its non-renewable nature. This may likely have a positive effect on the price of scrap metal since more recycling may be preferred

than mining of ores and hence an increase in the incomes of SMCs. However, though the use of economic measure to mitigate environmental damage and resource depletion has been proved to be an ineffective strategy for environmental management (Dasgupta et al., 2000; Hart, 1997), it serve as a contemporary strategy to encourage neo-liberal capitalism towards recycling options of finite and non-renewable resources conservation.

The fluctuating price of scrap metal has both negative and positive implications on the economic indicator of income sufficiency and negative impacts on income reliability. This is because a fall in the price of scrap metal will negatively reduce the value of scrap metal and hence lower the income of SMCs. An opposite effect has a positive impact on the value of scrap collected and hence an increase in the income of SMCs. The influencing factor of price fluctuations on income reliability is the uncertainty of the income of SMCs since the price of scrap metal is not fixed. This trend has the potential of creating an atmosphere of unease in the minds of SMCs and can discourage their enthusiasm in conducting the activity.

### **5.3 Income inadequacy to meet the needs of improved living conditions**

Though the average income of a SMC discovered as US\$87 was found to be more than the minimum wage, the income does not meet the monthly basic needs of a SMC. The US\$87 is an average estimate. It is vital to note that a few realized incomes higher than US\$87 while others get a monthly income far below the estimated amount. Irrespective of the fact that an income is realized from the activity, according to Lugo's (2007) quotation of an ILO report, it is important to note that an income is expected to meet the welfare needs of an individual for his or her general well-being and to provide a route out of poverty. But this is not the case here for SMCs. The low income from scrap metal collection could be attributed to factors that include the price of scrap metals, exploitation by entrepreneurs or middle agents, the demand for scrap metal and the absence of regulations on the scrap metal trade in the country. Improvement in the price per kg of scrap metal will largely have a positive effect on the incomes and livelihoods of SMCs. This may only be achieved if more emphasis is placed on metal recycling for the production of new metal materials than the mining of virgin ores and an increase in the demand for metal materials globally. The second and the last factors could be improved

upon by the appropriate trade authorities with adequate regulations on the price of scrap metal so as to minimize the vulnerability of SMCs and increase the opportunity for them to earn better incomes for their livelihoods. This could however be counter-productive to free market regulations, but can also be argued in defense of the bargaining power of vulnerable groups of societies and the minimization of the exploitative tendencies of entrepreneurs generally referred to as cheap labour.

#### **5.4 Risk of working conditions**

The working environment of SMCs is very risky and unfavorable. It is risky in the sense that it exposes SMCs to the risk of body cuts in the absence of protective clothing like boots, gloves and other essential equipment to protect from body cuts. The working environment is unfavorable because of the exposure of SMCs to disease contamination in fetching scraps from landfills and wreckages of abandoned sea vessels and other metal structures. The occupational hazards are therefore enumerable starting from body cuts, body pains, disease contamination from landfill areas and harassment from police and state authorities. The hazards could be minimized if SMCs wear protective clothing when fetching scrap metals. The cost of buying these clothing is a daunting task for SMCs since the incomes generated are hardly sufficient for their conditions of living. The local agents should facilitate such endeavours in a form of credit opportunities which expenses could be readily recovered from SMCs sale of scrap metals spread out over a period of time.

#### **5.5 Prospects of secured employment**

Employment has been defined by Lugo (2007) to include both formal and informal activities from which individuals earn an income for their wellbeing. Hence scrap metal collection can be classified as an informal employment activity (Wilson et al., 2006; Langenhoven & Dyssel, 2007). Informal employment activities such as scrap metal collection should also be concerned with the security of its activity vis-à-vis formal employment. Employment security within the context of this study can be interpreted to mean the long-term opportunities of scrap metal collection and sale. This will be directly related to the future demand of metal and the potentials of scrap metal recycling. As highlighted by Gordon et al. (2006), metal recycling holds a huge potential to meet the

future requirement of the increasing demand of metals globally. With this argument, and in the absence of any procedural change in the current mechanism of scrap metal collection, the possibilities of creating income opportunities for poor people engaged in this activity can be ascertained to be secure. That said, there is a need for regulation if the benefits provided by this activity are to be meaningful to the poor and vulnerable people engaged in scrap metal collection. For the regulations to be meaningful and effectively implemented, the participation of all stakeholders in the formulation of such regulations is deemed very vital.

### **5.6 Work insurance and pension benefits**

Social security for SMCs is regarded to be very vital in meeting the needs of the living conditions of SMCs at old age or when one is disabled to work due to an accident from work. Considering that the activity requires a large input of hard manual labour, it is observed that old people will find it very challenging to be engaged in this activity. Hence the living conditions of SMCs at old age or when SMCs can no longer collect scrap is a cause for concern. Opportunities exist within the NASSIT scheme which caters for both employed and self-employed workers to contribute and access pension at old age and insurance from accidents at work. However, none of the respondents of group 1, the focus group for this study (Table 2) are registered with the scheme. It is however difficult to generalize this trend to the entire group of SMCs. Information on personal savings of SMC was not part of the field work. So it is also difficult to indicate if savings or investment in other forms of savings is done by SMCs. A significant point to mention is the need to encourage SMCs to be enrolled in the social security scheme that will benefit them at old age or in the event of an accident at work. The national union of SLSMA should undertake a sensitization drive within its membership to encourage and explain the significance of having social security scheme.

### **5.7 Working time input and expected outcome**

The assessment on the number of hours of work per day input into the activity of scrap metal collection revealed that SMCs input a large amount of hours into their work but most of them do not realize incomes commensurate to the time spent on work. My observations also revealed an uncoordinated and unstructured mode of work in terms of

daily hours of work input. Most SMCs conduct the business of their activity during the day. However, it was observed that most SMCs work more than 8 hours daily in comparison with a daily wage worker who works 8 hours. While a few of the SMCs work less than 8 hours daily, more work hours input into the activity is proportional to the amount of scraps collected, though this cannot be true in all cases. But the proportionality in the amount of time input into the activity is not reflective of the income of SMCs when compared to a minimum wage worker. The SLSMA in collaboration with entrepreneurs should sensitize SMCs on the significance of collecting scrap metals with less corrosion that will attract good price. The sensitization should be geared towards enabling SMCs to be efficient in collecting scraps so as to maximize their productivity.

### **5.8 Conditions of living and human well-being**

Access to social services such as clean water, electricity and medical are considered in this study as some of the fundamental facilities required for good conditions of living and human well-being (Goklany, 2002; Prescott-Allen, 2001). The objective of the concept of ILO's decent work is ensuring that workers (both formal and informal) earn an income sufficient to meet the needs of basic services to improve their living conditions (ILO, n.d.). The discovery from the assessment indicating a large percentage of respondents lacking access to basic social services such as clean water, electricity and medical services points to the facts that, though SMCs are engaged in an informal employment activity, the income earned from such activity is not sufficient to enable them access the basic services associated with good conditions of living. The reason for the failure of the income of SMCs to meet the basic amenities of living is the low income earned from scrap metal collection. The low income realized from this activity is directly related to the price per kg offered to SMCs. The dual factors of lack of bargaining power in determining the price of scrap metal and the desperation to earn an income for livelihood cannot be unconnected to the issue of low income. Though the scenario of low income cannot be specific for scrap metal activity alone, an ILO report of 2006 indicated that low wage structure in the formal employment sector in Africa prevents 80% of African population from breaking the cycle of poverty (ILO, 2007). The failure of the incomes to meet the basic needs of improved living conditions can be interpreted as the livelihoods from scrap metal collection is unsustainable and cannot get the people out of poverty.

### **5.9 Benefits of waste reduction to landfills**

Reduction of waste in landfills and the environments is a significant environmental benefit from solid waste collection and recycling and hence a reduction of waste toxicity transferred to the soil and water bodies within and surrounding landfill areas. According to Langenhoven & Dyssel (2007), solid waste collection and recycling is realized as a strategic management option for municipal solid waste management. The notion can be further buttressed by a previous study in Dar es Salaam city in Tanzania by Kaseva & Gupta (1996) in which the collection and recycling or reuse of solid waste materials (such as scrap metals) underscores a sustainable management approach to municipal solid waste management. A very recent study in Enugu state in Nigeria qualifies the previous two studies in the amount of waste reduction to landfills by waste collection for reuse and recycling (Nzeadibe, 2009).

Although estimates of the amount of solid waste reduction from landfills was not undertaken in this study, but data from entrepreneur agents indicates that an average of 100 tonnes of scrap metal per entrepreneur is shipped to India monthly. Noting that six entrepreneurs are registered to export scrap metal in the country, a substantial amount of solid waste (approximately 600 tonnes) is extracted for export monthly. This creates a viable sustainable management approach for municipal solid waste and reduces the amount of space required for use as dumpsite for municipal solid waste.

### **5.10 General issues of livelihood opportunities**

A holistic view of the livelihoods of the poor, vulnerable and marginalized group of people engaged in scrap metal collection hinges on a number of factors. Firstly, the absence of gainful formal sector employment or other more beneficial informal<sup>7</sup> livelihood opportunities to enable people to secure incomes for their livelihoods comes to mind. The lack of infrastructure and livelihood opportunities in rural and peri-urban areas

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<sup>7</sup> Other informal livelihood opportunities are those self employment opportunities which require financial capital, credit facilities or other necessities for individuals to start a business for an income generating opportunity.



and the desire of people to seek greener pastures necessitate migration of individuals from these areas to urban areas in search of income generating opportunities and better conditions of living (Nzeadibe, 2009; Braima et al., 2006). Handley et al. (2009) indicated limited livelihood options and lack of employment opportunities are contributing factors to poverty in Sub-Saharan Africa. The political, educational and socio-economic policy structures required to tap the vast human resource capacity and offer employment opportunities are very limited in Sierra Leone and in other Sub-Saharan African countries rendering the majority of the populations unemployed.

The decade long civil conflict which began in the early nineties and ended in 2002 inflicted severe devastation to both human and infrastructural facilities (Braima et al., 2006). This led to a decline in living standards and increased unemployment (ibid). The contribution of private sector investment in creating employment opportunities was hindered and even the existing facilities were destroyed by the conflict. The conflict however, largely contributed to mass migration of people from the rural areas to the capital in search of safe heaven (ibid). The employment opportunities stemming from private sector investment have recently been further worsened by the current financial crises since the amount of much needed capital in the form of foreign investment in the country has been dramatically decreased.

The failure of state authority to provide social welfare services that could provide the basic necessities of living conditions attract significant blame for the conditions of poor people. Governments of states are expected to take the obligation of caring for their people or creating the enabling atmosphere for the generation of livelihood opportunities (Handley et al., 2009). They accomplished this by creating and implementing sound multidimensional policies and frameworks that are geared towards the creation of livelihood opportunities for the people and the sustainable development of the country (ibid). The policies should be largely focused on developing the capacities and choices of livelihoods for people and creating an enabling environment for achievement of the goals of the policies. The policies should include good governance, creating an attractive private sector investment opportunities, education and skills training for both formal and informal sector activities, creating credit facilities for the establishment of self

employment small scale businesses, support to agricultural, fishing and other livelihood activities.

The fundamental question that may need clarification is why are SMC not engaged in other self-employed livelihood activities such as agriculture? With agriculture being the self-employed livelihood activity with the largest number of people engaged in it (Braima et al., 2006), access to land and the resources needed for an individual to engage in agricultural activity are very limited and often not within the capacity of poor people. The access to credit facilities from financial and other credit institutions are also not accessible to this group of people. This is due to the lack of collateral security that financial institutions require in order for people to gain access to credit facilities to start farming or other business activity. These compounding factors limit the opportunities and choices of poor people to engaging in any other self-employment activity that requires financial and other resource input. Only those activities such as scrap metal collection that do not require any form of business registration and input capital creates the only livelihood opportunities for this group of people.

The need for education and training to develop the required skills for employment in both formal and informal sectors is a prerequisite for livelihood opportunities that can deliver improved living standards and eradicate poverty. The education and skills acquiring are not an end to livelihood since they have to be complemented with the opportunity of employment. The findings from field work reinforce this scenario. From Table 2, twenty-five percent of respondents are trained but are not employed. The need for education and training should be emphasized as a path towards the achievement of an income for human development and poverty eradication in order to achieve the first goal of UNMDG by 2015. It is also very vital to emphasize the need for the creation of employment opportunities within the economic framework to complement the wishes of the educated and trained personnel. But how can poor people educate themselves in a system where education is not free and the means necessary to train or educate requires financial input? It is therefore very apparent that either the state or other NGOs should step in to provide credits either as a loan or welfare service to enable poor people to break

the cycle of poverty. This can be done either in micro-credit schemes, free educational training etc.

According to a report on the analysis of employment in Sierra Leone by Braima et al., (2006), Freetown, the study area was discovered to have the highest rate of unemployment in the country according to the definition used by the authors of the report. However, though the general trend of people not earning an income for their livelihood was estimated as 45% among the working-aged population of the country, only 5% of employment was accounted for by the formal sector while the informal sector contributed 50% (ibid). The significance of incomes from the informal sector activities to meet the necessities of improved standards of living which the report failed to reveal is a vital aspect of poverty reduction and human development. As noted by the ILO, significant proportions of Sub-Saharan Africa's populations are engaged in employment activities, the incomes of which do not get them out of the cycle of poverty (Handley et al., 2009). Therefore the prudence of adequate income to meet the needs of improved conditions of living from informal sector activities such as scrap metal collection has to be a prominent feature of these activities rather than the enormity of the activities if the UNMDG goal of poverty eradication and human development is to be achieved.

## **6. Conclusions and recommendations**

The objective of this study was to clarify if scrap metal collection offers durable and secured livelihoods that are capable of lifting people out of poverty. But the result of the assessment conducted indicates the following;

- Scrap metal collection for recycling do offer an opportunity of livelihoods for poor vulnerable people in Freetown.
- Although the average monthly income generated from scrap metal collection was discovered to be more than the minimum wage of an unskilled worker in the formal employment sector, the income was found to be inadequate to meet the economic and social development of the people engaged in the activity and is therefore unable to eradicate poverty and achieve the first goal of the UNMDG.
- The discovery of the lack of social security such as pension was also crucial to the living conditions of retired people from the activity of scrap metal collection.

- Work hazards and the lack of insurance from work accidents further make the job of SMCs risky, unsustainable and do not meet the criteria of decent work from the ILO's perspective.
- The future prospect of scrap metal recycling is envisaged to be prosperous and can offer livelihood opportunities for poor people if the process of collection remains unaltered. However, price fluctuation has a negative influence on the motivation for the job and the realization of good incomes adequate enough to meet improved standards of living.

The opportunity of livelihoods from scrap metal collection can be transformed into meaningful benefits and be made a more sustainable strategy of improved livelihoods for poverty reduction and human development, if policies, regulations and the institutional capacity are streamlined and implemented towards a pro-poor agenda for human development. To accomplish this;

- A holistic and people focused approach in empowering the capacity of poor people to make choices for their livelihoods should be the key focused of intervention.
- Within this framework, the collaboration of all stakeholders such as SMCs, local agents and entrepreneurs, municipal solid waste management agencies, government agencies such as the ministries of trade, labour and state security to dialogue and design policies and regulations that will addresses issues of scrap metal price, price fluctuations and the provision of working tools and protective clothing in the form of credits to collectors.
- The implementation of the policies and regulations should be strictly adhered to. The policies and regulations should take into cognizance the importance of all stakeholders and harmonize their difference so that the exploitation of a stakeholder by the other is minimized.
- The SLSMA and the ministry of labour should embark on a sensitization drive on the importance of social security and encourage SMCs to enroll with the NASSIT scheme so as to solve the issue of social security and insurance against accidents at work. The SLSMA should also undertake education of its members

in collaboration with other stakeholders on the effective and efficient collection of scrap metals in a bid to increase their productivity.

- SMCs should also be encouraged and empowered to diversify their income generating activities by undertaking other income activities such as farming and fishing so as to reduce the risk of vulnerability to the external stresses and shocks of scrap metal collection. An example of the success of the diversification of livelihood activities was observed from the results of the field work. SMCs engaged in the activity as a secondary source of income were observed to be living in better conditions than those that rely only on scrap metal collection. The reason for this cannot be unconnected to an additional income which complements the affordability of improved conditions of living, and can also have a source of income if scrap metal collection is to be halted.
- Alternatively, entrepreneurs can be encourage to offer employment to SMCs with a wage adequate to meet improved socio-economic conditions of living for SMCs where issues of social security, work accidents insurance and the provision of working tools, equipments and protective clothing are well taken care of.
- The development of the capacity of poor people to make choices for the livelihoods that will meet the socio-economic needs of their living conditions should be a fundamental objective of poverty eradication and human development. Government and non-governmental organizations should take the leading role in the formulation and implementation of multi-dimensional policies and the empowerment of poor people so that the development of poor people's capacity to sustainable livelihoods can be achieved.

Recommendations for further researches related to this thesis are:

- A comparative study and analysis on the economic, social and environmental benefits between metal recycling and the mining of virgin ores is suggested for further research. This study will clarify the preconceived assumption of the environmental benefits of scrap metal recycling as compared to the mining of ores.

- Furthermore, research on an income threshold sufficient to offer the basic necessities of housing, clean water, electricity, medical services is suggested as further research. This will enable the determination of an income sufficient for a good standard of living for SMCs.

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## 8. Appendix

### 8.1 Sample questionnaire for SMCs

1. Sex: Male ☐ Female ☐ How long have you been collecting scraps?...
2. Age: .....
3. Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐
4. Household number of people/Dependants? .....
5. Educated ☐ Uneducated ☐
6. Level of Education: Primary ☐ Secondary ☐ Tertiary ☐
7. Skills trained for? .....
8. Are you willing to be trained for skilled employment activity? .....
9. Can you pay for such training? .....
10. Employment status: Employed ☐ Unemployed ☐
11. Type of Employment: Informal self employment ☐ Employer ☐
12. Do you have a social security number? .....
13. Why are you involved in scrap metal collection? .....
14. What is your weekly ☐ Monthly ☐ income from scrap metal sale .....
15. How much do you sell your collection per kg? .....
16. How many hours do you spend on scrap collection daily?
17. How many members of your household are engaged in scrap metal collection? ...
18. Are you engaged in any other income generating activity? .....
19. If engaged in other income activity, which is the predominant or more gainful activity compared to scrap metal activity? .....
20. Are the funds generated from scrap metal scavenging adequate to support your household/dependants? .....
21. What risk are you exposed to in scrap metal collection and sale/ Workplace hazards?
22. Where do you live? .....
23. Do you have electricity or pipe water in your house? .....
24. Can you afford to pay for electricity? .....
25. Where do you get medical service when you are ill? .....
26. What are the obstacles in scrap metal scavenging activities? .....
27. Do you pay taxes from your income? .....
28. Are you affiliated to an organization or union? .....
29. Are you been regulated by the central authority? .....
30. Are you ashamed of doing this work for a living? .....
31. Is the scrap metal collection a registered business or an illegal activity? .....
32. How do you think your livelihoods from scrap collection can be improved?

### 8.2 Sample questionnaire for agents/entrepreneurs

1. Sex: Male ☐ Female ☐
2. Age: .....
3. Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐
4. Household number of people/Dependants? .....
5. Educated ☐ Uneducated ☐
7. Skills trained for? .....
8. Employment status: Employed ☐ Unemployed ☐

9. Why are you involved in scrap metal trade? .....
- .....
10. What is the name of your company/firm? .....
11. How much do you buy scrap metal? .....
12. Who sets the price of scrap metal? ...
13. Where are your collection shipped to .....
14. How long have you been into this business? .....
15. Please explain how you conduct your transaction.....
- .....
16. What are the risks associated with the business of scrap metal? .....
- .....
17. What are the obstacles/constraints in scrap metal business? .....
- .....
18. Is your agency a registered business entity? .....
19. Are you affiliated to an organization or union? .....
20. Are you been regulated by the central authority? .....
21. What future prospects do you envisage in the scrap metal industry? .....
- .....
22. How many tons of scrap do you export monthly? .....
- .....
23. Has the NGOs expressed any concerns in your activity? .....