FACTORS LEADING TO ABANDONMENT OF PUBLIC BUILDING INFRASTRUCTURE IN MALAWI: THE CASE OF LILONGWE DISTRICT COUNCIL

MASTER OF SCIENCE INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (MSC IDM) THESIS

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UNIVERSITY OF MALAWI

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by

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DECLARATION

I declare that this thesis is my own work. It is submitted in partial fulfillment of the requirements for the Master of Science Degree in Infrastructure Development and Management at the Polytechnic, University of Malawi. It has not been submitted for any degree or examination to any university or college.

SIGNATURE:

DATE:

CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval

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DEDICATION

This study is dedicated to all the people who inspired, supported and encouraged me as follows;

- My daughter, Monica Lungu, who all along my study showed interest in what I was doing about school at such an old age to her .
- My mother, Eunice Lungu, for giving me hope that I can always do it and her love, support and encouragement.
- To all my relations that still go to school, it is my sincerely hope that this will inspire them to pursue their education and live successful lives.

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I also extend my gratitude to my family and friends for their sacrifices, support, patience and love throughout the study period.

ABSTRACT

Building infrastructure projects in Malawi's local authorities are unreasonably delayed and ultimately abandoned. This is due to several factors. The purpose of this study was to investigate the factors leading to the abandonment of public building infrastructure projects in Malawi, under the health and police sectors in Lilongwe District Council. Sixty-three (63) project abandonment sub attributes were identified through review, the project abandonment sub attributes then categorized into eight main groups, i.e., financial, procurement, contract management, planning, design, site, workmanship and/or community involvement related sub attributes. These factors were then studied, analyzed and evaluated in order of their importance and compared separately and combined across the police and health sectors of Lilongwe District Council.

Fourteen (14) projects (police-8, health-6) were chosen (some incomplete and/or operational since they were commenced). Responses from the 117 project stakeholders (respondents) were collected through a survey questionnaire. Data analysis was statistically done using Microsoft Excel and SPSS. The RII, Crobatch alpha and Spearman's methods were used to further analyze the data. Research findings reveal that financial and contract management related attributes ranked the highest as having contributed most to the project abandonment in the study sectors respectively. While results show variations across the sectors, it can also be observed that the Malawi Government funded projects under police while cooperating partners funded projects under health sectors. The study concludes that although financial and contract management attributes are key to building infrastructure abandonment, these factors are not mutually exclusive. It is therefore recommended that a further investigative study on these be done and replicated to other sectors to come up with relevant solutions to the problem of building infrastructure abandonment in police and health sectors of Lilongwe District Council.

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LIST OF ABBREVIATIONS

ADC	Area Development Committee
CCC	Certificate of Completion and Compliance
CDF	Constituency Development Fund
CIDB	Construction Industry Development Board of Malaysia
GNP	Gross National Product
HBA	National House Buyers Association
HDA	Housing Development Act 1966
ICT	Information and Communication Technology
LAD	Liquidated and Ascertained Damages
LDF	Local Development Fund
LL DC	Lilongwe District Council
MASAF	Malawi Social Action Fund
MHLG	Ministry of Housing and Local Government
MHRC	Malawi Human Rights Commission
MK	Malawi Kwacha (Currency in Malawi)
MP	Member of Parliament
N	Number of Respondents
ORT	Other Recurrent Transactions
RII	Relative Importance Index
RK	Rank(ing)
TA	Traditional Authority
VDC	Village Development Committee

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CHAPTER 1

INTRODUCTION

1. 1 Background

The construction industry plays a very important role in the economy of a developing country like Malawi, contributing to Malawi's annual per capita gross domestic product (GDP) and this is evident in the sense that gross infrastructure has developed around or near areas of development. Increasing the infrastructure development to rural and urban areas has the potential of increasing the GDP (Foster & Shkaratan, 2011; World Bank, 2012). About 0.8 percentage points of southern Africa's improved per capita growth performance during the 2000s is credited to improve structural and stabilization policies (Calderon, 2009), while 1 percent is related to improvements in the countries' infrastructure platforms. In the case of Malawi, most of the boost was due to the ICT revolution, while power and roads contributed very little. Simulations suggest that if Malawi's infrastructure can be improved across the board to the level of the African leader-Mauritius, annual per capita growth rates would be 3.5 percent higher than they are at present. No single sector bears the entire responsibility for this: power, customs, transport, and water all having a material impact on the productivity deficit. Malawi's infrastructure backbones follow the north-south axis running parallel to Lake Malawi. Power and ICT backbones are national in nature, with no regional integration at present, although a number of cross-border connections have been proposed. Regional transport connectivity is also quite limited (Foster & Shkaratan, 2011).

The Malawi Growth and Development Strategy II [MGDS II] (GoM, 2012:84) is the overarching operational policy document that has been designed to strategically assist Malawi to achieve the Millennium Development Goals (MDGs). The MGDS II succeeded MGDS I (GoM, 2006: 23) and is for the period from 2011 to 2016. The main objective of the MGDS II is to continue the Government of Malawi (GoM) initiatives of poverty alleviation through sustainable economic growth and infrastructure development. Infrastructure development is among the six broad thematic areas that are identified in the MGDS II. The other five thematic areas include social development, social support and disaster risk management, improved governance and cross cutting issues. These form the pillars for the key priority areas in achieving poverty reduction in Malawi. In terms of infrastructure development housing and urban infrastructure development are singled out under the infrastructure development theme as one of the key components for creating

an enabling environment for private sector driven economic growth and provision of timely and quality social services. This policy document on infrastructure development is in line with the Malawi Decentralization policy (1998) which was followed by the Malawi Local Government Act [MLGA] (1998; 6-7) which provided the legal framework for implementation of the policies on development in the local district authorities. Implementation of the Decentralization Policy entails the transfer of some functions from Central Government to the Local Authorities.

1.2 Decentralization Policy

Government of Malawi adopted the Decentralization Policy in 1998. The enactment of the MLGA (1998) provided the legal framework for implementation of the policy. Implementation of the Decentralization Policy entails the transfer of some functions from Central Government to the Local Authorities. Effective from the 2005/2006 fiscal year, Government started the process of devolving sector ORT budgets to the Local Authorities with three (3) sectors of Health, Education and Agriculture at a total budget of MK3 billion (Chiweza, 2010). The 2011/2012 budget therefore marks the seventh anniversary of the Fiscal Decentralization of ORT budgets to Local Authorities. The number of devolved sector budgets has moved from three in 2005/2006 to fourteen in the 2011/2012 Budget Estimates. The devolved sector budget has moved from MK3 billion in 2005/2006 to MK16 billion in the 2011/2012 Budget Estimates. This represents a movement of 433% over the period. Government's commitment to the fiscal decentralization reform process has been well demonstrated. Local Authorities shall further facilitate the implementation of short to medium term intervention projects through the Constituency Development Fund which has been revised from MK3 million to MK4 million per Constituency (Chiweza, 2010).

The City Councils of Zomba, Mzuzu, Blantyre and Lilongwe shall further undertake road infrastructure network projects and other infrastructure projects through the City Infrastructure Development Fund with allocations of MK98 million each for Blantyre, Lilongwe and Mzuzu City Councils and MK65 million for Zomba City Council (Chiweza, 2010). In Malawi, for example, if a local council has for one reason or another failed to complete projects within the initial allocated budget, the central government may decide to cut on the next budget for that particular council to finish the projects. From the 2011/12 local authority budgets' outlook above the main source of funds for development is the Constituency Development Fund (CDF) but it was first introduced in 2006. The Infrastructure Fund has been comparatively minimal and

restricted to the four city councils of Malawi. The implementation of the CDF projects has to a large extent followed decentralization approach. The projects to be implemented are demanded by the community through the village development committees (VDCs) and prioritized at constituency level before funding is allocated. According to the new guidelines on CDF the most influential person is the MP of the area in terms of identification, implementation of the CDF projects i.e. responsibilities of the MP of the area are more than any other stakeholder at community level in the GoM Guidelines for the CDF (GoM, 2014). Contractors who work on CDF projects are chosen by constituency committee among the community around the project site. These are normally artisans (people with relevant technical skills) and they get paid by the district council secretariat after doing the job.

In Lilongwe District Council CDF projects are mainly concerned about maintenance of school blocks, teacher's houses in addition to new construction projects of small bridges, police units, and health clinics. New construction projects under CDF in Lilongwe District Council have taken years without completion. In worst scenario the projects have been completely abandoned. Apparently, this has been the case in areas where there has been a change in Member of Parliament after an election. The other fund, which has just been established by the Malawi Government through the Central Government Transfers, is the District Development Fund (DDF) whose guidelines state that projects should be generated from the respective district development plans and that the District Commissioner should manage the funds. The fund will concentrate on projects that are infrastructure in nature, which can have tangible results (GoM Guidelines for the Utilization of the Development Budget, 2015). In Lilongwe this fund has already brought controversy between Councilors, MPs and the District council Secretariat staff. Councilors feel that the fund should be managed at ward level such that the funds should be allocated to the wards while MPs and District Council Secretariat staff feel that it is important to follow the guidelines, which have been provided. This is likely to be a potential sign of a project delay, which would lead to projects abandonments.

1.3 Research Problem

The problem of this study is the very low project completion rates in police and health sectors of Lilongwe District Council. Despite adopting decentralized system of identifying projects and involvement of the community through the project cycle, police and health sectors of Lilongwe

District Council still suffer most in terms of projects abandonment. From the extracted project progress report for the period 2006-2015, it shows that police and health sectors have 20% and 33% project completion rates respectively. The major effect of this is that resources are wasted and not used for the expected outcome. In this regard, the beneficiaries of the projects are the ones that suffer the consequences of abandoned projects because the intended outcomes of the projects are not achieved. The stakeholders who release funds for the projects are also affected by the abandonment of the projects because the resources that they committed for the development projects are wasted. Some resources that are used in the funding of the abandoned projects are provided directly by the central government whose major source is tax revenue. The loss of these resources entails a loss to society since the whole society is involved in tax payment. There is also a higher opportunity cost in the abandoned projects in the sense that the resources that are committed to the projects would have been used in other meaningful development projects that would have benefited the society as a whole.

1.4 Research Justification

In the context of Malawi and this research, there is no law in relation to declaring a project abandoned. However, for the purposes of this study, it is assumed that a project is abandoned if there is no activity on site for at least six consecutive months that the project infrastructure is not operational despite being structurally completed. Several abandoned projects exist under the Constituency Development Fund in various Malawi District Councils due to a number of factors (LL DC CDF Report, 2015). One of these district councils with such projects is the Lilongwe District Council. The abandonment of construction projects is not unique to Malawi as it is also present in other countries, e.g. United States (Hicks, 2008), & Spain (Carrero *et al*., 2009). In Malawi, this problem is also not only in Lilongwe District Council as many district councils experience the same problem.

In Chikwawa District Council, for example, 71% of the teachers houses constructed under Local Development Fund in 2012 were uncompleted or abandoned due to mismanagement (MHRYN Report, 2014). However, in Lilongwe District Council this problem is interesting in that it is mostly health and police infrastructure projects that are to a greater extent abandoned especially at an operational stage. From period 2006-2012 there were 8 police office blocks and 6 health infrastructure projects in Lilongwe District Council which were never completed (LL DC Infrastructure Projects Progress Report, 2015). These projects were initiated through the Village Development committees in line with the Decentralization Policy and were financially supported

either by Government of Malawi and/or Donors. The value of these abandoned projects if critically analyzed might be enormous and great loss. The economic loss suffered by the district council and the opportunity cost incurred by the beneficiary community could be very high and should not be underrated. This study therefore focused on investigating the factors that are leading to this interesting scenario of very high project abandonment in police and health sectors of Lilongwe District Council so that further studies could be done to find solutions of solving the problem.

1.5 Research Objectives

1.5.1 Main Objective

The main objective of the study is to investigate the issues that lead to abandonment of infrastructure projects under the Health and Police sectors in Lilongwe District Council.

1.5.2 Specific Objectives

The study seeks to:

(i) Identify the attributes and sub-attributes that cause project abandonment in the Police and Health sectors in Lilongwe District council

(ii) Analyze the attributes and sub-attributes that cause project abandonment in the Police and Health sectors in Lilongwe District Council.

(iii) Compare the main causes of project abandonment in the Police and Health sectors.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review chapter highlights the theoretical framework, study attributes and a discussion on the study sub-attributes related to the abandonment of infrastructure projects in Malawi with reference to similar studies done in Africa, Asia and America.

2.2 Infrastructure Projects

Alegre *et al*. (2008) distinguished four categories in terms of the functions served by infrastructure investment: (i) Redistribution, (ii) Public goods, (iii) Hospitals and schools, and what they call simply (iv) Infrastructure, which is traditional public works projects, of which transportation is by far the most important in quantitative terms in most countries. As they argued, this type of public works investment has the most direct economic impact by reducing firms' production and transaction costs. The economic impact of government investment in health and education sectors is more long-term and less direct in character, as it facilitates the building up and maintenance of the economy's stock of human capital. Investment in public goods affects the economy's efficiency indirectly through framework conditions for productive activity.

Several authors outline concepts and characteristics of the factors that lead to the abandonment or failure of infrastructure building projects. According to Bahl and Bird (2000) from the societal common denominator of basic needs, five basic goals of development can be deduced, namely: (i) Economic growth to secure food and other requirements for the population; (ii) Social justice to reduce inequality; (iii) Employment as means of earning an income but, as well, because of its ethical and social value; (iv) Participation as political involvement and social sharing; and (v) Independence as freedom from external domination. While individual societies may have different opinions on the priorities of the goals, in the absence of a general theory of development; one can use the criterion of fulfillment of these goals as a yardstick in development. Development may then be understood as a simultaneous progress towards these five goals (Zhao & Kanamori, 2007).

2.3 Global Infrastructure Sectors

Infrastructure is the productive capital structures that underpin the economy and society and contribute over time to the achievement of its economic and social goals (Johnson *et al*., 1995).

Social infrastructure has emerged over the last decade mainly due to the fact that public infrastructure is the most apparent form of construction which interests the society at large (Duffield, 2001). In this regard, economic infrastructure and social infrastructure have consequently emerged. Although both economic and social infrastructures have significant social impacts on individuals, communities, and the general public at large in terms of practicality, a distinction between both infrastructures based on their social impact is ambiguous and difficult to establish (Gilmour *et al*., 2010; Bhattacharyay, 2009). Increasingly, the meaning of infrastructure has been shifting from one focusing on physical fixed assets such as roads, airports, sea ports, telecommunications systems, water distribution systems and sanitation (what might be called public utilities). It now often embodies notions of softer types of infrastructure such as information systems and knowledge bases (Button, 2002).

Infrastructure can be categorized into hard infrastructure and soft infrastructure. Hard infrastructure refers to physical structures or facilities that support the society and economy, such as transport (ports, roads and railways); energy (electricity generation, electrical grids, gas and oil pipelines); telecommunications (telephone and internet); and, basic utilities (water supply, hospitals and health clinics, schools, irrigation, etc.). The latter refers to non-tangibles supporting the development and operation of hard infrastructure, such as policy, regulatory, and institutional frameworks; governance mechanisms; systems and procedures; social networks; and transparency and accountability of financing and procurement systems (Bhattacharyya, 2009). Broadly defined, therefore, infrastructure refers to all basic inputs into and requirements for the proper functioning of the economy. Investment in infrastructure can contribute to sustainable growth by; Reducing transaction costs and facilitating trade flows within and across borders; Enabling economic actors-individuals, firms, governments; Lowering the costs of inputs for entrepreneurs, or making existing businesses more profitable; Creating employment, including in public works; Enhancing human capital, for example by improving access to schools and health centers; and, Improving environmental conditions, which link to improved livelihoods, better health and reduced vulnerability of the poor (DFID, 2002).

2.4 Abandonment of Infrastructure Projects

Doraisamy *et al* (2014) defined an abandoned project in two different ways, namely: 1) when a progress of a certain work faces too many problems and seems to be impossible to continue

further causing it to stop completely or 2) when a project has been started at an earlier date, but for some reasons has been stopped. Such abandonments are just not limited to buildings alone, but there are also roads, industrial structures, bridges, factories, dams, and electricity and communication projects. A project is considered abandoned in Malaysia based on five conditions, namely; 1) if there has been no substantial activity on site for six consecutive months, or 2) if it is involved in a winding-up petition registered at the High Court, or 3) if it is under receivership, or 4) if the developer has informed the Housing Controller in writing of his inability to complete the project, or 5) if the project has been certified to be abandoned by the Minister (MHLG, 2011). Olusegun and Micheal (2011) define project abandonment as to stop doing a project because there are too many problems and it is impossible to continue. The effects of abandonment of projects are disappointment of the users, low living standards, unemployment, and wastage in resources and decrease in revenue to project owners. The choice of studies, largely from, Africa provided an excellent comparison with countries with similar characteristics hence such countries have similar causes and mitigation measures. Studies revealed that there are abandoned projects in other countries such as Malaysia, Nigeria, Ghana, Uganda, Swaziland, Zambia, Botswana, South Africa, Tanzania, and indeed Malawi. These studies are directly related to this study in that they deal with housing construction projects as well as general construction similar to Malawi being a developing country. In the case of Malawi, particularly Lilongwe District Council a number of infrastructure building projects were funded; some of them completed whilst others were not completed and got abandoned in the period beginning 2006 and ending 2012. Table 2.1 below presents a summary of this status over the stated period.

Table 2.1: Project Completion Statistics in Lilongwe District (2006-2012)

Type of Project/Sector	Funded Projects (No)	Completed Projects (No)	Uncompleted Projects (No)	Completion Rate(%)
Education	221	221	0	100
Health	9	3	6	33
Water	2000	2000	0	100
Police	10	2	8	20

Abisuga (2014), Owolabi *et al*. (2014), Tom (2013), and Chirwa *et al*. (2011) identify the following factors as leading to either infrastructure project abandonment or failure: design, contract, and procurement issues; contract management, site, financial, community involvement

and workmanship issues; not meeting expectations, lack of change management processes, lack of sponsorship, insufficient resources or budget, reporting failure on critical problems, lack of risk planning, rampant schedule delays and missed commitments, over budgeting, low morale, uncontrolled scope creep abounds, no clear direction, poor management, undefined objectives and goals, lack of management commitment, lack of user input, lack of organizational support, centralized proactive management, poorly defined roles and responsibilities, conflict, competing priorities, poor communication, insufficient resources, business politics and overruns of schedule and cost estimates, ignoring project warning signs, inadequate testing processes and bad decisions. In this study, critical factors to infrastructure project abandonment or failure were selected from a long list of the identified factors. These factors were arranged into eight (8) categories as follows; financial, procurement, contract management, community involvement, planning, workmanship, design and site related issues.

2.5 Categories of Construction Project Abandonment Factors

2.5.1 Financial Related Sub-Attributes

Financial sub-attributes are directly related to payments in project construction. Alaghbari *et al.* (2007) identified delays in payment to contractors and funding problems were the causes of project construction completion delays. The identified effects were time overrun, cost overrun, and had negative social impacts. These factors may cause delays and disruptions and effects that put construction project at risk of abandonment. Fugar and Agyakwah-Baah (2010) found that financial factors include honoring certificates, underestimation of the cost of the project, underestimation of the complexity of project, difficulty in accessing bank credit, and fluctuation of prices/rising cost of materials. Late payment is defined as failure of a paymaster to pay within the period of honoring of certificates as provided in the contract. The parties involved in the process of payment claim such as client, contractor, and other construction players may cause a payment to be delayed due to client's poor financial and business management, (ii) withholding of payment by client, (iii) contractor's invalid claim, (iv) delay in valuation and certification of interim payment by consultant, (v) inaccuracy of valuation for work done, (vi) insufficient documentation and information for valuation, (vii) involvement of too many parties in the process of honoring certificates, and (viii) heavy workloads of consultant to do evaluation for work done (Abdul-Rahman *et al*., 2006).

In construction, delay is the time overruns either beyond the completion date stipulated in contract or beyond the agreed date for delivery of a project between the parties (Aibinu & Jagbora, 2002). The authors describe delay as a circumstance when the contractor and the project owner jointly or severally contribute to the non-completion of the project within the original or the stipulated or agreed contract period. Various studies on corruption blame on the greater number of contacts with public officials in developing countries, on lower-paid local public officials who have more incentive to steal than higher-paid central officials, and on local government voters who have not yet learned to use their power to monitor and discipline their employees. These problems may be especially serious with respect to infrastructure, where there is more latitude for fraud, bribery, embezzlement, and patronage than with respect to other, more regular activities of local public officials and politicians. Moreover, local corruption, even if smaller in scale, may be particularly damaging to building "trust" in government, owing to the more visible inequalities that may result. Perhaps the common perception of high local corruption is unduly influenced by its greater visibility; corruption may be even greater with respect to centralized decisions if they are less transparent (Bahl & Bird, 2000). However, Tanzi and Davoodi (2000) argue that corruption will lower infrastructure spending while Mauro (1995) argued that corruption is more likely to raise infrastructure spending (higher unit costs). As Estache (2006) notes, corruption is a symptom of a deeper underlying problem-the lack of political commitment and accountability.

According to Aigbavboa *et al.*(2014) and Akinsiku and Akinsulire (2012) the growing rate of delays due to delays in processing payments and difficulties in project financing by the contractor is adversely affecting the timely delivery of construction projects. Their results suggest that client's cash flow related problems are the main causes of delays while time and cost overruns are the major identifiable effects of delays in construction projects. Contractors also suffer if projects are abandoned. They may be forced to wind up their companies just because of the failure of collection of payment from one single project. The consequences may be extended to businesses along the supply chain such as subcontractors, suppliers and construction workers. For the developers, they may suffer from bad reputation and financial losses (Obeng & Patel, 2014; Perumal, 2009b). Banks may suffer because of bad debts (Kong, 2009), while land owners suffer because their lands are abandoned Government may have to step in and utilize public funds to

revive abandoned construction projects (Cheong, 2012 & Gasper, 2010). When it comes to legal battles, it incurs huge amount of expenses to all the parties involved.

Abisuga *et al*. (2014) in Nigeria found out that factors that cause construction delay are cash flow problems, clients financial difficulties, and lack of project financing. On the causes and effects of project delays Mukuka *et al* (2012) identify the following challenges in Zambia; delays in progress payments, difficulties in financing projects by the contractor, and delay in approving major changes in the scope of work. Sambasivan and Soon (2007) found that generally, the cause of abandoned construction projects is financial problems in Indonesia. Olusegun and Micheal (2011) identified the following construction project abandonment factors; project planning, inadequate funding, inflation, bankruptcy of contractor, inadequate cost control and delayed payment. Adequate financial resources by the project owners as well as contractors allow payments to be timeously processed by the owners; adequate resources in terms of construction materials, labour and money to be made available by the contractor; timely payments of salaries to employees by the contractor which motivates them; and that fraudulent practices are minimized to ensure that no delays take place and hence the project is completed in time. On the other hand if delays in construction arise a project may either be abandoned or become a failure. Eight(8) financial sub-attributes were selected for further analysis; financial difficulties faced by the owners, financial difficulties faced by the contractors, inappropriate financing by the donors, delays in interim payments, underestimation of project cost, fraudulent practices and briberies and unexpected economic conditions.

2.5.2 Procurement Related Sub-Attributes

Procurement is the acquisition of goods and services. This includes anything from office supplies, to construction materials, to the services of contractors and sub-contractors. Procurement is one way in which companies interact with one another and it could be considered that the actions of a company are only as sustainable as those of its suppliers (Abd El-Razek *et al*, 2008). Construction procurement addresses the organizational and contractual structures under which a project is brought about. Often the construction project brings together individuals or organizations that are separate and disparate to form what has been termed a temporary multi-organization or a temporary project coalition. Even in non-traditional procurement methods where participants on the construction project can sometimes be under a single organization, interactions on the project can lead to conflicts. Projects are executed through what can be described as a collection of people or teams. Conflicts remain a challenge in the construction

industry with the potential of leading to project failures; litigation and sometimes outright project abandonment (Hafez *et al*., 2013). Conflicts equally occur in areas that include processes, people, resources, structure and uncertainty.

Various studies of corruption have placed the blame on the greater number of contacts with public officials in developing countries, on lower-paid local public officials who have more incentive to steal than higher-paid central officials do, and on local government voters who have not yet learned to use their power to monitor and discipline their employees. These problems may be especially serious with respect to infrastructure, where there is more latitude for fraud, bribery, embezzlement, and patronage than with respect to other, more "regular" activities of local public officials and politicians. Corruption may be even greater with respect to centralized decisions if they are less transparent (Bahl & Bird, 2000). However, Tanzi and Davoodi (2000) argue that corruption will lower infrastructure spending while Mauro (1995) argues that corruption is more likely to raise infrastructure spending (higher unit costs). As Estache (2006) notes, corruption is a symptom of a deeper underlying problem-the lack of political commitment and accountability.

In Indonesia Sambasivan and Soon (2007) found that one of the causes of abandoned construction projects is inefficient public delivery system and mismanagement. Agbiboa (2014) and Obeng and Patel (2014) reported that corruption practices are an enduring obstacle to Nigeria's development writ large. The author then made a case for the reworking of a pervasive system in Nigeria that pardons corruption and recycles corrupt rulers. A study by Amade (2015) found that revealed that nine factors were crucial in containing failure and abandonment of public sector construction projects in Nigeria, amongst which was an effective procurement process. Abisuga *et al* (2014) found out that factors that cause construction delay are improper material procurement systems. If project materials and equipment are not made available due to lengthy tendering processes, there will be project delays at all stages of the project, resulting in price fluctuations overtime making project costs or go beyond budget estimates and eventually causing project abandonment or failure. The following three(3) procurement sub-attributes were selected for further analysis; unavailability of materials and equipment, tendering process and inappropriate pricing/initiatives of services rendered by contractors.

2.5.3 Contract Management Related Sub-Attributes

Contract management is the whole process of systematically and efficiently managing contract creating, execution, and analysis made with customers, vendors, partners, or employees for the

purpose of maximizing financial and operational performance and minimizing potential risk. It also entails negotiating the terms and conditions in contracts, ensuring compliance with the terms and conditions, charges and cost monitoring, ordering and payment procedures, documenting and management reporting, contract maintenance and agreement on any changes that may rise during its implementation or execution (Dmaidi *et al*., 2013). The major construction contracting problems or obstacles facing the contracting process and the construction contracting sector from the perspective of local contract parties include: policy adoption of awarding the bid to the lowest prices not to the most accurate, delaying contractor owed payments, currency exchange changing value, client's delays in decision making, little projects size in relation to contractors number, construction materials changing prices due to inflation, declining in the country economic situation, contractors maneuvers by downloading some prices on other items and presence of conflicts between tender documents.

Moreover, a typical construction project involves many trades and participants, who are linked with other upstream and downstream industries (Ng, 2009b). These include producers of construction materials, transportation companies, and providers of labor force (contractors). These companies will not grow since there will be no business if a construction project is abandoned. If a public infrastructure project is abandoned it may be argued that the economic impacts are never directly felt by the public as they are absorbed by the government's reserves. Sunday and Afolarin (2013) found that clients are the major stakeholders responsible for the generation of errors in construction documents. The causes of these errors are lack of adequate documentation, poor communication, negligence and changes to design specifications among others. The effects of these factors on construction projects include project abandonment, delays, rework, dissatisfaction by project owners and lack of confidence in project consultants.

Muhwezi and Otim (2014) attributed project construction delays to consultants, contract, client and external delay related factors in Uganda; Aiyetan *et al* (2011) in South Africa suggested interventions at the construction stage as the solutions to reduction of delays in construction of project on elimination of delays on building construction projects in South Africa. A study by Thwala and Mvubu (2008) revealed that lack of resources by the contractor; inability to provide insurance of works by the contractor; and larger contract packages which make small and medium size contractors develop projects of poor quality in Swaziland as some of the causes. If these contract management bottlenecks remain unchecked they affect project construction in

several ways, namely; ensuing of disputes or conflicts, compromise of quality of works, and that sooner or later project construction may be abandoned or fail. Good contract management principles allow project delay warning signs, reduce bureaucracy and red tape in decision-making within the project, enhance commitment and support by management of the organization in project success; creates good relationships amongst project team members, good contract administration; minimizes communication and coordination problems, and enhances good project quality control. If this is done it will lead to construction project completion. If it is not done it will therefore either be abandoned or fail.

The following fifteen(15) contract management attributes were identified for further analysis; business politics, ignoring project warning signs, bureaucracy and red tape within the project, lack of prioritization and project portfolio management, poor relationship among project team members, poor contract administration, material management problems, communication and coordination problems, lack of organizational support, bad decisions, project control problems, lack of management commitment, competing priorities, litigation and poor quality control.

2.5.4 Community Involvement Related Sub-Attributes

Community participation is the direct involvement of the citizenry in the affairs of planning, governance and overall development programs at local or grass roots level (Williams, 2006). It is essential for cost reduction through the utilization of local labour and expertise; implementation of appropriate responses through the involvement of locals in collective decision-making, through the assessment of their needs and expectation; and directing scarce resources towards the more needy identified by fellow locals (Mayavo, 2002). Thus, community participation is seen as an undertaking that results in the empowerment of the local population. However, it also has numerous curious elements in the democratic decision-making process. In community participation, people are the central point of development process as emphasis is placed on the development of capacities, skills to enable them negotiate and source materials they require in order to improve their lives (UNDP, 2000).

According to Thwala and Aigvabvoa (2011) citizens need to build capacity and resources in order to achieve community participation in planning and project development; that citizen's participation in community development projects does not usually occur by chance, but because certain principles are observed at an acceptable level to the participants and to other stakeholders,

and that citizens will voluntarily participate in a community activity if they could derive benefit to themselves and the entire community. Participation is the natural result of empowerment. Empowerment is not a means to an end but is the objective of development. In addition to having the power to make decisions, it demands the knowledge and understanding necessary to make correct decisions. Communities cannot make wise decisions if they do not have the required information (Thwala, 2009). All stakeholders in the project must be involved in order to avoid project delays (Amede, 2008).

However, communities may not participate in construction projects if there is poor project management, poor management of funds, no commitment and motivation, low level of education of project members, lack of youth involvement in community-based projects, lack of monitoring and evaluation by government officials and community leaders, lack of training and unavailability of workshops for project members and lack of government involvement Ndou (2012) and this may further lead to failure or abandonment of community-based projects. Communities get involved in development through public works programs with a purpose to get either a wage or food. In Malawi, for example, Devereux and Macauslan(2006) reported that public works programs have delivered food, income and agricultural inputs, as well as employment opportunities to under-employed households. Apart from transferring resources to the poor, public works projects also build or maintain assets such as physical infrastructure. The achievements of public works in Malawi look impressive, for example, hundreds of thousands of people have been employed, and numerous assets have been created (roads, water-points, woodlots, school buildings). However, concerns about public works programs relate to: Whether the assets created have economic value and are sustainable; What level of payment is fair and poverty-reducing, while also self-targeting the poor; Whether workers should be paid with cash wages, food rations or agricultural inputs; and evidence suggesting that public works are not a cost-effective measure compared to other social protection instruments, such as unconditional cash transfers.

Public works programs refer to activities, which entail the payment of a wage in return for the provision of labour, in order to (i) enhance employment and (ii) produce an asset, with the overall objective of promoting social protection. Public works are popular with policymakers because they offer the potential of simultaneously creating useful assets and transferring food or income to the poor, while being self-targeting, avoiding dependency and minimizing ‘leakages’ to the

non-poor, because of the work requirement. In Malawi a wide range of public works programs-food-for-work, the government, donors and NGOs have implemented cash-for-work, and inputs-for-work since the early 1990s, with the objective of providing an employment-based safety net for households facing chronic or transitory food shortage (Kishindo, 2000). Kambewa (2005) then outlines recent the following types of public works activities in Malawi: Food-for-work, Cash-for-work, and Inputs-for-work.

Kishindo (2000) reported that the Malawi Social Action Fund (MASAF) tend to subscribe to a demand-driven approach in its evaluation of community projects, thereby introducing an element of competition in community development. This has led to imbalances in socio-economic infrastructure, between those districts whose communities have been unable to initiate their own projects and those where there is more sophisticated development-conscious leadership. More equitable and effective grassroots development can be implemented in the following ways: (i) participation of people in an effort to improve their living conditions with as much reliance as possible on their own initiatives; and (ii) provision of technical and other services by governmental agencies in ways that encourage initiative, self-help and mutual help and make these more effective. The Malawi government has used community development as a strategy for creating economic and social infrastructure such as rural roads, bridges, schools, health units, post offices and water schemes. This strategy involves the mobilization of community labour and government financial and technical resources to execute specific projects (Kishindo, 2000). The following seven(7) sub-attributes; vandalism of works, not meeting end user expectations, lack of user input, inexperienced client/owner, lack of cooperation from local authorities, negative impact of project to society/environment, and cultural clash among parties in project.

2.5.5 Project Planning Related Sub-Attributes

Studies by Thwala and Mvubu (2008) and Eshofonie (2008) in Swaziland revealed inadequate managerial skills as deficiencies leading to failure of small and medium size construction projects. Akinsiku and Akinsulire (2012); Olusegun and Micheal (2011); Mahamid *et al*.(2011); Ameh and Osegbo (2011); and Sambasivan and Soon (2007) all argue that construction projects are abandoned due to inadequate project planning and incompetent project managers which adversely affects the timely delivery of construction projects and may lead to occurrences of delays in construction. Early appointment of project managers could ensure proper management of both the human and material resources that could guarantee improved productivity and

ultimately save projects from time overrun. A similar study by Alinaitwe *et al* (2013) in Uganda found that poor project monitoring and control can cause of construction delays and overruns. Correct planning allows for participatory project processes which includes beneficiary communities to be part and parcel of the planning processes. It further allows for proper scheduling, appropriate risk allocation, realistic time frame and tasks, appropriate contract management, project feasibility studies and well defined project objectives and goals. These lead to project completion or success. Conversely, poor project planning leads to delays, cost overruns and material shortages which further lead to either project abandonment or failure (Alinaitwe *et al*., 2013). The following ten(10) sub-attributes were selected for further analysis; government policy, lack of appropriate dispute resolution methods, unclear lines of responsibilities, project planning and scheduling, inappropriate risk allocation, unrealistic time frame and tasks, involvement of large number of project participants, inappropriate contract arrangement, project feasibility studies and undefined objectives and goals.

2.5.6 Workmanship Related Sub-Attributes

Poor workmanship quality may be caused by lack of experience and competence of labourers; poor funding of public building projects, poor quality building materials, poor construction management and lack of supervision during project execution (Shittu *et al*., 2012). Enshassi *et al.*(2009) identified delays because of borders/roads closure leading to materials shortage; unavailability of resources; low level of project leadership skills; escalation of material prices; unavailability of highly experienced and qualified personnel; and poor quality of available equipment and raw materials as most important factors affecting project performance eventually leading to poor project workmanship. While Abisuga *et al.* (2014) found that inadequate consultant and contractor experience, lack of coordination, and shortage of construction materials cause project construction delay, Haseeb *et al* (2011) in Pakistan argue that delays come due to several factors such as finance and payments, inaccurate time estimation, quality of materials, delay in payments to supplier and subcontractor and unforeseen site condition. Good workmanship in project construction leads to a reduction of unnecessary delays due to rework as a result of construction errors; speeding up the authorities to effect timely payments and saving of the resources due to use of the right skills in the project. Poor workmanship on the other hand leads to unnecessary delays and wastage of resources leading to either project failure or abandonment. The following five (5) workmanship sub-attributes; incompetent contractors/sub-

contractors, low productivity of labour, unskilled/incompetent site workers, rework due to errors during construction, and incompetent consultants.

2.5.7 Design Related Sub-Attributes

Cost overruns are related to problems in the design process (Rwakarehe & Mfinanga, 2014; Alinaitwe *et al*., 2013). The remedy to the problem is to improve the management of project designs, enhance the process of reviewing design reports, improve the design process safety audit and geometric design manuals, and increase staff to match the work-load. According to Amade (2015) failure and abandonment of public sector construction projects in Nigeria, may be due to lack detailed and comprehensive designs by the contractors, and effective communication and information management by design team. Abisuga *et al* (2014) reported that poor design causes project construction delay. On the causes and effects of project delays Mukuka *et al* (2012) identify the following design related challenges in Zambia-delays in approving major changes in work scope; Thwala and Mvubu (2008) identified inadequate technical skills as leading to delays in construction project completion in Swaziland; and according to Olusegun and Micheal (2011) construction projects are abandoned due to variation of project scope, wrong estimates, and faulty designs.

Mukuka *et al* (2012), Olusegun and Micheal (2011) and Thwala and Mvubu (2008) all stress that a good project design process is important because it allows for fewer mistakes or errors on drawings, specifications, and scope works; leads to proper construction method deployment due to clear drawings, specifications and work scope; and leads to reduced variation orders which control project costs. Accordingly, poor designs on the other hand lead to a lot of errors on engineering drawings, specifications, and scope of work; construction methods which eventually leads to a contractor making mistakes that will lead to delays in construction as it may take longer to make design corrections. This causes resource depletion which erodes the construction budget and therefore it can either lead to project abandonment, discontinuation or total failure. Based on the review on design issues this study identified the following design related five(5) sub-attributes which may lead to project abandonment; ambiguities or mistakes in scope of works, specifications or drawings, improper construction methods, difficulty in design, conflicts between drawings and specifications and misrepresentation of drawings and specifications.

In Tanzania, Kikwasi (2012) assessed causes and effects and disruptions in construction projects in Tanzania and found that among the causes of delays and disruptions and their effects that put construction projects at great risk were the design changes.

2.5.8 Site Related Sub-Attributes

Uncertainties on site issues include (i) difficulty of design and construction, (ii) adverse weather, (iii) unavailability of materials and equipment, (vi) unexpected location difficulty, and (v) ambiguity or mistakes in scope of work, specifications or drawings. Generally, this factor is related to unexpected site conditions, sudden increase of the price of material, and ambiguity or mistakes in scope of work, specifications or drawings. Related problems include weak soil condition hence the need to increase reinforcement such as piling, the land is too hilly therefore it needs a lot of cutting and filling and is more prone to slope failure, and another case where the land is too low and it needs to be filled up. Also included is infrastructure problems whereby the developer overlooked the need to tap water from a farther source, which is costlier (Hoe, 2013).

Abandoned construction projects also affect the society and environment negatively. For instance, some abandoned projects may have pools of stagnant water that serve as breeding ground for mosquitoes (Bavani, 2009) and threaten public health. Abandoned construction projects also attract people like drug users, criminals and vagrants to occupy the abandoned sites (Hoe, 2013) and hence threaten public security. Abandoned construction sites may pose danger to the public, particularly children who venture into the area to play (Hoe, 2013). Abandoned construction projects affect the environment negatively as it may be used as a rubbish dump (Bavani, 2009; Obeng & Patel, 2014). Also, some have become unsightly overgrown with undergrowth (Bavani, 2009). In Spain, the unpleasant view caused by abandoned projects is known to reduce the value of the surrounding properties (Carrero *et al*., 2009).

Abisuga *et al* (2014) in Nigeria and Sambasivan and Soon(2007) in Malasyia both found that factors that cause project construction delays include poor site management and supervision, poor site management and supervision. Such good site conditions improve the quality of infrastructure by not compromising the engineering standards at reasonable possible cost. If the engineering or construction standards are compromised due to poor site conditions, the construction project may either be abandoned or unusable due to poor quality of the infrastructure as it may be safety risk. Ten (10) site related sub-attributes were identified for further analysis; lack of motivation to site

workers, relationship between site workers and contractor, poor safety management on site, industrial action, shortage of site workers, adverse weather conditions, site acquisition problems, unexpected locality difficulty, site/soil conditions and poor site management. The identified eight (8) study attributes and sixty-three (63) study sub-attributes are summarized in Table 2.2 below:

Table 2.2: Project Abandonment Factors

No	Type of Attribute	Sub-Attributes
1	Design	Difficulty in design, ambiguities or mistakes in scope of work, specifications or drawings; conflict between drawings and specification, misinterpretation of drawings and specifications, and improper construction methods
2	Project planning	Inappropriate risk allocation among project team members, inadequate project feasibility studies, Lack of appropriate dispute resolution methods, in appropriate project planning and scheduling, involvement of large number project participants, unclear lines of responsibilities, undefined objectives and goals, unrealistic time frame and tasks, unfavorable government policy, inappropriate contract management
3	Contract management	Business politics, ignoring project warning signs, bureaucracy and red tape within the project, lack of prioritization and project portfolio management, poor relationship among project team members, poor contract administration, material management problems, communication and coordination problems, lack of organizational support, bad decisions, project control problems, lack of management commitment, competing priorities, litigation and poor quality control
4	Procurement	Unavailability of materials and equipment, tendering process and inappropriate pricing/initiatives of services rendered by contractors
5	Site	Lack of motivation to site workers, relationship between site workers and contractor, poor safety management on site, industrial action, shortage of site workers, adverse weather conditions, site acquisition problems, unexpected locality difficulty, site/soil conditions and poor site management
6	Community involvement	Vandalism of works, not meeting end user expectations, lack of user input, inexperienced client/owner, lack of cooperation from local authorities, negative impact of project to society/environment, and cultural clash among parties in project
7	Financial	Financial difficulties faced by owners, financial difficulties faced by contractors, inappropriate financing by donors, delays in interim payments, underestimation of project cost, fraudulent practices and briberies and unexpected economic conditions
8	Workmanship	Incompetent contractors/sub-contractors, low productivity of labour, unskilled/incompetent site workers, rework due to errors during construction, and incompetent consultants

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter outlines the methodology used for the study. A quantitative methodology approach is used to investigate the specific objectives. The sampling procedure is described first followed by methods of data collection and analysis, and discussions on the methods used in this research.

3.2 Study Sites

The research study was conducted in the 9 traditional authorities of the 18 in Lilongwe District, Malawi. Specific site details are as outlined in Table 3.1 below. The Lilongwe District Council had five categories of infrastructure projects under implementation in the period under consideration and these are; education, health, police, water and roads sectors. Water and Education had the highest number of projects and completion rates as indicated on Table 2.1. Police and Health sectors had the lower number of projects and lower completion rates of 20% and 33% respectively. The Police and Health sectors were the focus of this study due to their higher degree of project abandonment status than the other sectors and therefore 14 project sites were purposively targeted for investigation.

Table 3.1: List of the Study Sites

No	Name of Project	Traditional Authority	Year Started	Status as at December 2015	Funding Agency
1	Chitekwere Police Unit	Chitekwere	2007	Abandoned	DDF/CDF
2	Mpingu Police Unit	Malili	2007	Abandoned	DDF/CDF
3	Msundwe Police Unit	Kalolo	2004	Not completed	CDF
4	Kang'oma Police Unit	Tsabango	2008	Abandoned	DDF/CDF
5	Malembo Police Unit	Khongoni	2010	Abandoned	CDF
6	Chiwamba Police unit	Chimutu	2011	Completed but not operational	MHRC
7	Nsaru Police Unit	Kabudula	2008	Abandoned/vandalized	CDF
8	Ukwe Police Unit	Kabudula	2007	Abandoned/vandalized	CDF
9	Mapembe Police Unit	Chadza	2008	Abandoned	DDF/CDF
10	Nathenje Health Centre	Chadza	2006	Abandoned/vandalized	EU Micro
11	Chilobwe Health Centre	Khongoni	2006	Abandoned	EU Micro
12	Kalumbu Health Centre	Kalumbu	2008	Abandoned/vandalized	Taiwan/JICA
13	Nkhoma Hospital	Mazengera	2010	Abandoned	LDF
14	Nguluwe Health Centre	Malili	2006	Abandoned/vandalized	EU Micro

3.3 Sampling Procedure

3.3.1 Target population

The survey targeted all construction projects in the health and police sectors that started from 2006 and were still not completed and or not operational by December 2015. See Table 3.1 for project status by funding agency.

3.3.2 Sampling Method

A short list of all respondent practices that met the sample requirements was used for random sampling. For example, project committee members were chosen to participate in the study because they must own the projects; site workers were chosen for the study because they were directly involved when the projects were being implemented; and that the government sector heads were chosen for the study because these were the service providers to the communities through project implementation. Leedy and Ormrod (2001) outline the following guidelines for the identification of a sufficient sample:

(i). For a small population-less than 100 people, there is no need for sampling.

(ii). If the population size is around 500, 50 percent of the population should be sampled.

(iii). If the population is around 1500, 20 percent of the population should be sampled.

(iv). Beyond a certain point–at about 5000 units or more, a sample of 400 people is adequate.

Due to lack of a sampling frame the above criteria for sampling was not adopted, instead purposive sampling was adopted. Purposive sampling is a non-probability sampling method in which elements are selected for a purpose, usually because of their unique position. Palys (2008) suggested three guidelines for a purposive sampling strategy, namely; Knowledge about a situation or experience being studied; willingness to talk and representative of a range of views. In this study, the respondents satisfied this criterion.

3.3.3 Sample Size

The questionnaire survey was administered to ten (10) people per study site, targeted as follows;

- Five from the beneficiary community-four from committee that instituted during implementation and one community leader (chief) from around the project area.
- One government official of the relevant sector from around the project area.
- One site worker who was employed locally by the contractor during implementation.

- One officer representing the company that constructed the project.

- Two sector heads, one for health and one for police.

Thus, the questionnaires were distributed to 10 respondents per study site.

3.4 Questionnaire Design

The questionnaire had two sections, the first section was on respondent's general information and the second section covered the 8 attributes and 63 sub-attributes. The respondents were asked to tick in the appropriate columns to indicate how much they agree that the factors are causes of abandoned construction projects on a five point Likert Scale, i.e. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly agree (5). Table 3.2 below shows the rating scale adopted in the study.

Table 3.2: Ordinal Scale of Rating

Scale Factor	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Rating	1	2	3	4	5

The questionnaire was in two languages, namely, English and Chichewa. The English Version was administered to those respondent groups literate in English while the Chichewa Version questionnaire was administered to mostly the community members including the local leaders. The questionnaire is appended as B (English Version) and C (Chichewa Version).

3.4.1 Data Collection

Data collection was done using a survey questionnaire in three phases. Phase 1 was a pilot in which 24 respondents were targeted. Phase 2 involved 56 more respondents. Phase 3 involved 60 respondents. In total, 140 questionnaires were administered to 140 respondents. Research assistants were recruited to administer the questionnaires and upon completion by respondents the questionnaires were collected the same day.

Table 3.3: Respondent Distribution by Type and Project

Type of respondent	Name of Project														
	Nguluwe H/ Centre	Nkhoma G/ Shelter	Mapembe Police Unit	Kalumbu H/ Centre	Kang'oma Police Unit	Msundwe Police Unit	Ukwe Police Unit	Malembo police Unit	Mpingu Police Unit	Nathenje H/ Centre	Chitekwere Police Unit	Nsaru Police Unit	Chiwamba Police Unit	Chilobwe H/ Centrre	Total
Committee members	5	5	5	5	5	5	5	5	5	5	5	5	5	5	70
Sector Heads	3	2	2	2	2	2	2	2	2	3	2	2	2	2	30
Health / Police officer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Contractor	1	1	1	1	1	1	1	1	1	1	1	1	0	1	13
Site Worker	1	1	1	0	1	1	1	1	1	1	1	1	1	1	13
Totals	11	10	10	9	10	10	10	10	10	11	10	10	9	10	**140**

Table 3.4: Respondent Distribution

Phase	Respondents					Phase Total
	Committee Members	Sector Heads	Health/ Police	Contractor	Site Worker	
1	10	6	2	3	3	**24**
2	30	12	6	4	4	**56**
3	30	12	6	6	6	**60**
Total	**70**	**30**	**14**	**13**	**13**	**140**

3.4.2 Pilot Study

The questionnaire was tested during the first phase for precision of expression, question duplication, objectivity, suitability to problem situation and probability of favorable reception and return. A pilot questionnaire was administered to 24 respondents in a bid to obtain their comments regarding any items that they found difficult to understand, and to determine the time it takes to complete the questionnaire. During the pilot it was observed that the respondents especially the committee members had difficulties to distinguish between disagree or agree in the scale rating as the questionnaire was in English language. After the pilot, the questionnaire was translated into Chichewa (vernacular) as appended at the end and the respondents were thoroughly guided from start to finish in completing the questionnaires. The answers given during the pilot can thus be taken with confidence.

3.4.3 Participation Arrangements

Participants were formally informed in advance of the research exercise through the Lilongwe District Commissioner's Office by telephone and text messages. Further meetings were pre-arranged. Subsequent contacts were made directly through the communities and other respondents to fix dates, times and venues of meetings for questionnaire administration. Most of the respondents had contact telephone numbers.

3.4.4 Time Duration for Responses

The respondents were requested to complete the questionnaires within a day. This was possible because on average it was taking about half an hour for most users to complete filling the questionnaire. However, most of committee members had struggles to complete the questionnaire within the target time.

3.5 Data Analysis

Microsoft Excel and SPSS computer packages were used to analyze the data. Using the Microsoft Excel, the Relative Importance Indices were derived while from the SPSS Cronbach Apha values were derived. The Relative Importance Index method was used to measure the level of importance of attributes and sub-attributes and then these were ranked. Factor analysis with Cronbach's Alpha reliability analysis has been used to identify groups or clusters of sub attributes (Field, 2005), i.e. to group the 63 potential causes into groups of correlated causes, each group represents a latent cause and to see how well the sub attributes within each group measure a common construct. The Spearman's Ranking Correlation Coefficient was used to measure the similarity in ranking a list of items between two different groups of respondents (Field, 2005; Naoum, 2007), i.e. the ranking of the 63 potential causes of abandoned construction projects by the different questionnaire responding groups.

3.5.1 Relative Importance Index (RII)

The RII has been employed by the study in order to rank the factors that determine project abandonment in order of importance, from the factor that has great importance in determining project abandonment, to the factor that has less importance in contributing to project abandonment. First of all the study presents the RII of the health and police sector combined, then afterwards the study analyses each of the sectors separately. The following formula has been applied by the study to compute the RII; this formula is according to Muhwezi *et al* (2014) who conducted an assessment on the factors causing building construction delays in Uganda:

$$RII = \frac{\sum W}{A * N} \quad (0 \le RII \le 1)$$

Where

- W - is the weight given to each factor by the respondents and ranges from 1 to 5, (where "1" is "strongly disagree" and "5" is "strongly agree");
- A - is the highest weight (i.e. 5 in this case) and;
- N - is the total number of respondents.

The RII ranges between 0 and 1. If a factor has RII of closer to 1 then it means that the factor is ranked highly in the hierarchy of importance of determining project abandonment compared to a factor that has a lower index (RII of closer to zero).

3.5.2 Cronbach's Alpha Analysis

Cronbach's reliability analysis checks whether the attributes associated with an underlying factor extracted from factor analysis are consistent and reliable measures of the underlying factor (Field 2005). Field (2005) specifies the procedures and criteria involved in this analysis. In order to find out if the scale was internally consistent for each project abandonment issue, reliability analysis based on the Cronbach's alpha coefficient was conducted. The results indicate that the Cronbach's alpha coefficient for most of the categories is greater than 0.7 with the exception of procurement and community involvement, which are decimally around 0.7. This can be due to high sensitivity of the Cronbach's alpha coefficient to the number of items (Pallant, 2015). Overall, the alpha coefficient shows that the scale is internally consistent and reliable to measure the attributes.

Table3.5: Reliability Statistics by Attributes

Attribute	Cronbach Alpha Value	Number of Sub-Attributes
Workmanship	0.777	5
Community Involvement	0.699	7
Financial	0.736	6
Site	0.798	10
Contract Management	0.85	15
Design	0.826	5
Project planning	0.758	10
Procurement	0.664	4

3.5.3 Spearman's Correlation Method

In this study, the Spearman's Correlation Coefficient is used to identify and test the strength of relationship (MEI, 2007) between two sets of attributes of project abandonments for the 28 relationships in Lilongwe District Councils police and health sectors. in order to compute the

Spearman's Correlation Coefficient, Microsoft Excel sheet was used. The value of *r* was computed using Microsoft Excel as follows;

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Where

- ***n*** is the number of samples; and
- ***d*** is the difference between the ranks of the two variables.

The Spearman's Correlation Coefficients for each factor relationship based on the formula above are presented in detail in Appendix F and from each an *r*-value is presented as a summary in Table 3.6 below presents a summary of the *r*-values for each of the 28 relationships of the project abandonment attributes.

Table 3.6: Spearman's Correlation Coefficients

N	Correlated Pair of Attributes	*r*-Value
1	Design - project planning	0.7725
2	Design - contract management	0.6967
3	Design – procurement	0.7044
4	Design – site	0.7143
5	Design – financial	0.6044
6	Design - community involvement	0.6747
7	Design – workmanship	0.6791
8	Project planning - contract management	0.8527
9	Project planning – procurement	0.8692
10	Project planning – site	0.8505
11	Project planning – financial	0.7978
12	Project planning -community involvement	0.7275
13	Project planning – workmanship	0.7714
14	Contract management – procurement	0.8418
15	Contract management – site	0.6967
16	Contract management – financial	0.5604
17	Contract management - community involvement	0.6703
18	Contract management – workmanship	0.6462
19	Procurement – site	0.8286
20	Procurement – financial	0.8505
21	Procurement -community involvement	0.7363
22	Procurement – workmanship	0.7495
23	Site- financial	0.8505
24	Site - community involvement	0.8725
25	Site – workmanship	0.8857
26	Financial - community involvement	0.6923
27	Financial – workmanship	0.7143
28	Community involvement - workmanship	0.9077

In order to determine whether each relationship was significant and not random the research hypotheses were tested against 5% a significance level: The null hypothesis was that there is no relationship between any two project abandonment factors while the alternative hypothesis was that there is a relationship between any two project abandonment factors.

Using a Chart for Critical Values for Spearman's *r*ho (for two tailed hypothesis – Appendix G), adopted by (Ramsey, 1989) the critical r-value at 5% significant level for the 28 pairs Spearman's Correlation Coefficients as outlined in Table 3.6 is 0.390. The calculated *r*-values exceed the critical value: $r_{calculated} > r_{critical\ value} = 0.390$. Therefore, the null hypothesis is rejected and the alternative hypothesis that there is a significant positive correlation among the project abandonment factors, is accepted at 5% level of significance.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

The data was quantitatively analyzed using four techniques, first by simple statistics such as frequencies and percentages through Microsoft excel; secondly, Relative Importance Index method through Microsoft excel; thirdly, the Spearman's Rank Correlation coefficient through Microsoft excel to establish the ranking of the factors that determine project abandonment in Lilongwe District Council. Finally, the Cronbach's reliability method was used for factor analysis to check consistency within the categories.

4.2 Response Rate

Table 4.1 presents the frequencies and percentages of the copies of the questionnaire that were distributed and those that were filled and received.

Table 4.1: Response Rate

Respondent Category	**No. of Questionnaires Distributed**	**No of Responses Received**	**% of Responses Received**
Contractors	13	11	84
Committee Members	70	50	71
Site workers	13	13	100
Sector Heads	30	18	60
Health/Police	14	7	50
Total	**140**	**99**	**71**

Based on Table 4.1 one hundred forty (140) copies of the questionnaire were distributed out of which ninety-nine (99) were completed and received. This represents 71% response rate. This response rate is above 50% response rate in sample size determination. Therefore, it may be said that overall the results represent more than 50% of the responses of the target population. In terms of the breakdown of the responses for each category of respondent 84%, 71%, 100%, 60% and 50% response rates for contractors, communities, site workers, sector heads and health/police workers respectively were targeted for the investigations. Hence, the responses may represent more than 50% of the target population in each category of respondent except for sector heads.

4.3 Attributes and Sub-attributes

4.3.1 Sub-Attributes for Police and Health Combined

Table 4.2 below presents the ranking based on the RII of all the sub-attributes determining project abandonment in the health and police sector combined in Lilongwe District Council. Data analysis found that vandalism of works-in progress or finished was the factor that had great importance in determining project abandonment in the health and police sector in Lilongwe District Council. This is evidenced by the higher RII of the attribute of 0.597 compared to the other remaining variables. The second variable in this ranking of importance is not meeting end user expectation, which had RII of 0.579. The other variables are as can be seen from the table. The variable that has the least importance in determining project abandonment in Lilongwe District Council is litigation. Litigation refers to a legal proceeding in a court; a judicial contest to determine and enforce legal rights.

Table 4.2: Project Abandonment Sub-Attributes and RII Ranking

Sub Attributes	N	RII	RK
Vandalism of works – in progress or finished	117	0.597	1
Not meeting user expectation	116	0.579	2
Unavailability of materials and equipment	117	0.5749	3
Business politics	117	0.5744	4
Financial difficulties faced by owner	115	0.5739	5
Financial difficulties faced by contractors	115	0.5635	6
Lack of user input	117	0.559	7
Inappropriate financing	117	0.547	8
Unfavourable government policy	116	0.5379	9
Lack of appropriate dispute resolution methods	116	0.5362	10
Delays in interim payments	117	0.5333	11
Ignoring project warning signs	117	0.5145	12
Bureaucracy and red tape within the project	117	0.5094	13
Lack of prioritisation and project portfolio management	117	0.506	14
Poor relationship among project team members	117	0.5026	15
Poor contract administration	116	0.5017	16
Lack of motivation to site workers	117	0.4906	17
Faulty tender process	112	0.4893	18
Material management problems	117	0.4872	19
Under -estimation of project cost	115	0.487	20
Communication and coordination problems	117	0.4803	21
Lack of organizational support	115	0.4783	22

Bad decisions	117	0.4718	23
Project control problems	116	0.4672	24
Unclear lines of responsibilities	117	0.465	25
Inappropriate project planning and scheduling	117	0.4581	26
Inappropriate risk allocation among project team members	115	0.4556	27
Fraudulent practices and briberies	116	0.45	28
Inappropriate pricing/incentives of services rendered by contractors	117	0.4496	29
Unexpected economic conditions	117	0.44957	30
Poor quality control	117	0.4479	31
Lack of management commitment	117	0.44786	32
Unrealistic time frames and tasks	116	0.4448	33
Inexperienced client / owner	117	0.4342	34
Involvement of large number of project participants	117	0.43419	35
Incompetent contractors / sub-contractors	116	0.4293	36
Low productivity of labour	116	0.4259	37
Problems related to variation orders	117	0.4222	38
Ambiguities or mistakes in scope of work, specifications /drawings	116	0.4207	39
Inappropriate contract management	116	0.4172	40
Inadequate project feasibility studies	115	0.4139	41
Relationship between site workers and contractor	117	0.4103	42
Unskilled / incompetent site workers	117	0.4086	43
Rework due to errors during construction	117	0.4068	44
Improper construction methods	117	0.4051	45
Incompetent consultants	117	0.3932	46
Undefined objectives and goals	117	0.3932	47
Poor safety management on site	116	0.3897	48
Difficulty in design	117	0.388	49
Industrial action	117	0.3778	50
Shortage of site workers	114	0.3772	51
Lack cooperation from local authorities	116	0.3707	52
Adverse weather conditions	117	0.3692	53
Negative impact of project to society / environment	116	03655	54
Site acquisition problems	117	0.3607	55
Competing priorities	114	0.3526	56
Cultural crash among parties in project	116	0.3517	57
Conflicts between drawings and specifications	117	0.3401	58
Unexpected location difficulty	117	0.3385	59
Misinterpretation of drawings and specifications	117	0.3316	60
Site conditions	116	0.3259	61
Poor site management	116	0.3136	62
Litigation	115	0.2991	63

4.3.2 Ranking of Attributes for Health and Police Sectors Combined

After computing the RII of the 63 sub-attributes and ranking them, further analysis by attributes based on the health and police sectors combined was done. Through this analysis and without considering a sector the highest mean RII was determined for the most important issue leading to project abandonment in the health and police sectors in Lilongwe District Council. Table 4.3 below outlines RII for the attributes-Health and Police Sectors Combined.

Table 4.3: RII for Attributes-Health and Police Sectors Combined

Attribute	N	RII	RK
Financial	116	0.5149	1
Procurement	116	0.4838	2
Contract management	116	0.4674	3
Community involvement	116	0.4654	4
Project planning	116	0.4556	5
Workmanship	117	0.4127	6
Design	117	0.3771	7
Site	116	0.3754	8

4.3.2.1 Financial Related Sub-Attributes: Health and Police Combined

Financial sub-attributes have the highest aggregate RII of 0.5149 meaning they have the highest project abandonment impact. This result agrees with Frimpong and Oluwoye (2003), and Alaghbari *et al*. (2007); and Assaf *et al*. (1995) who found that financial problems are the main factors that cause delays and later abandonment of ground water projects in Ghana, and causing delays in building construction projects in Malaysia respectively. Based on Table 4.4 below, the factors that contributed more to abandonment of public projects in the health and education sector in Lilongwe District Council by order of importance include: Financial difficulties faced by the owner with RII of 0.5739, financial difficulties faced by the contractors (RII=0.5639), in appropriate financing (RII=0.5471), and delays in interim payments (RII=0.5333). In this category underestimation of project costs, fraudulent practices and bribes and unexpected economic conditions had less impact on the abandonment of the projects in the two sectors of interest.

Table 4.4 : RII for Financial Related Sub-Attributes: Health and Police Sectors Combined

Sub Attribute	N	RII	RK
Financial difficulties faced by owner	115	0.5739	1
Financial difficulties faced by contractors	115	0.5635	2
Inappropriate financing	117	0.5471	3
Delays in interim payments	117	0.5333	4
Under - estimation of project cost	115	0.4870	5
Fraudulent practices and briberies	116	0.4500	6
Unexpected economic conditions	117	0.4496	7
Average		**0.5749**	

4.3.2.2 Procurement Related Sub-Attributes: Health and Police Combined

The study has established that procurement sub-attributes emerged second in order of importance as far as project abandonment in the health and police sector in Lilongwe District Council is concerned with an RII of 0.4838, which is the second highest RII from financial sub-attributes category based on Table 4.3. The procurement sub-attribute, which is the most important in project abandonment, is unavailability of materials and equipment with an RII of 0.5744 in Table 4.5. This is seconded by tendering processes with RII of 0.4893, while the last two factors have lower RII values implying they are less important, i.e. inappropriate pricing/incentives of services rendered by contractors with an RII of 0.4494 and variation orders with an RII of 0.4222.

Table 4.5 : RII for Procurement Related Sub-Attributes: Health and Police Sectors Combined

Sub Attribute	N	RII	RK
Unavailability of materials and equipment	117	0.5744	1
Tender process	112	0.4893	2
Inappropriate services, pricing, incentives rendered by contractors	117	0.4494	3
Variation orders	117	0.4222	4
Average		**0.4839**	

4.3.2.3 Contract Management Related Sub-Attributes: Health and Police Combined

Contract management related sub-attributes came third in Table 4.3 with an aggregate RII of 0.4674. Under this project abandonment in the two sectors is attributed to: Business politics

which ranked high with an RII of 0.5744, seconded by ignoring project-warning signs with an RII of 0.5145, then bureaucracy and red tape within the project at 0.5094, lack of prioritization and project portfolio management at 0.506 as outlined in Table 4.6. Litigation had the lowest RII of 0.2991.

Table 4.6: RII for Contract Management Related Sub-Attributes-Health and Police Sectors Combined

Sub Attribute	N	RII	RK
Business politics	117	0.5744	1
Ignoring project warning signs	117	0.5145	2
Bureaucracy and red tape within the project	117	0.5094	3
Lack of prioritization and portifolio management	117	0.5060	4
Poor relationship among project team members	117	0.5026	5
Poor contract administration	116	0.5017	6
Material management problems	117	0.4872	7
Communication and coordination problems	117	0.4803	8
Lack of organizational support	115	0.4783	9
Bad decisions	117	0.4718	10
Project control problems	116	0.4672	11
Poor quality control	117	0.4479	12
Lack of management commitment	117	0.4479	13
Competing priorities	114	0.3526	14
Litigation	115	0.2991	15
Average		**0.4694**	

4.3.2.4 Community Involvement Related Sub-Attributes: Health and Police Combined

Community involvement had an aggregate RII of 0.4654 based on Table 4.3, which is fourth highest aggregate RII in contributing to abandonment of projects in Lilongwe District Council. In this category, vandalism has the highest RII of 0.5966 based on Table 4.7. Vandalism is either in the progress of project or after the project has been finalized. Vandalism also happens to have the highest RII out of all the 63 sub-attributes in the study. This suggests that most of the abandonment of projects in the health and police sector in Lilongwe District Council is due to

vandalism of works on the project sites. The second sub-attribute under community involvement not meeting end user expectations with an RII of 0.5793 based on Table 4.7. This RII is second from the highest both in this category and in ranking of all the sub-variables.

Table 4.7: RII for Community Involvement Related Sub-Attributes-Health and Police Sectors Combined

Sub-Attribute	N	RII	RK
Vandalism of works - in progress or finished	117	0.5966	1
Not meeting end user expectation	116	0.5793	2
Lack of user input	117	0.559	3
Inexperienced client/owner	117	0.4342	4
Lack of cooperation from local authorities	116	0.3707	5
Negative project impact to society/environment	116	0.3655	6
Cultural crash among parties in project	116	0.3517	7
Average		**0.4653**	

4.3.2.5 Project Planning Related Issues: Health and Police Combined

Project planning attribute had an aggregate RII of 0.4556 based on Table 4.3. The sub-attribute that contributed more to this category based on Table 4.8 were government policy with an RII of 0.5379, lack of appropriate dispute resolution methods with an RII of 0.5362, and so forth. Government policy is the major factor leading to the abandonment of projects in Lilongwe District Council as far as the health and police sector are concerned. Workmanship, design and site issues had the lowest aggregate RIIs compared to the other categories, and this suggests that the three categories are less important in project abandonment for the Health and Police sectors in Lilongwe District Council.

Table 4.8: RII and Project Planning Related Sub-Attributes: Health and Police Combined

Sub-Attribute	N	RII	RK
Government policy	116	0.5379	1
Lack of appropriate dispute resolution methods	116	0.5362	2
Unclear lines of responsibilities	117	0.465	3
Project planning and scheduling	117	0.4581	4
Inappropriate risk allocation	115	0.4557	5
Unrealistic time frame and tasks	116	0.4448	6
Involvement of large number of project participants	117	0.4321	7
Inappropriate contract arrangement	116	0.4172	8
Project feasibility studies	115	0.4139	9
Undefined objectives and goals	117	0.3932	10
Average		**0.4556**	

4.3.2.6 Workmanship Related Sub-Attributes: Health and Police Combined

This attribute had an aggregate RII of 0.4127 based on Table 4.3. Incompetent contractors/sub-contractors turned out to be sub-attribute with greater importance in project abandonment under workmanship category. Incompetent contractors/subcontractors have an RII of 0.4293 based on Table 4.9, followed by low productivity of labor with RII of 0.4259. Incompetent consultants are the least important in determining project abandonment in Lilongwe District Council.

Table 4.9: RII and Workmanship Related Sub-Attributes-Health and Police Combined

Sub-Attribute	N	RII	RK
Incompetent contractors/sub-contractors	116	0.4293	1
Low productivity of labour	116	0.4259	2
Unskilled/incompetent site workers	117	0.4086	3
Rework due to errors during construction	117	0.4068	4
Incompetent consultants	115	0.3932	5
Average		**0.4127**	

4.3.2.7 Design Related Sub-Attributes: Health and Police Combined

The design attribute had an aggregate RII of 0.3771 based on Table 4.3. Based on Table 4.10 ambiguities or mistakes in scope of work, specifications or drawings have an RII of have an RII of 0.4207; improper construction methods have an RII of 0.4051; difficulty in design has 0.3880,

conflicts between drawings and specifications and misinterpretation of drawings and specifications have 0.3316.

Table 4.10: RII for Design Related Sub-Attributes: Health and Police Combined

Sub-Attribute	N	RII	RK
Ambiguities/mistakes in work scope, specifications, drawings	116	0.4207	1
Improper construction methods	117	0.4051	2
Difficulty in design	117	0.388	3
Conflicts between drawings and specifications	117	0.3401	4
Misinterpretation of drawings and specifications	115	0.3316	5
Average		**0.3771**	

4.3.2.8 Site Related Sub-Attributes: Health and Police Combined

The site attributes had an average RII of 0.3754 based on Table 4.3 and it ranked eighth in order of importance to project abandonment in Lilongwe District Council. The sub-attributes based on Table 4.11 in this category include: Lack of motivation to site workers with RII of 0.4901, relationship between site workers and contractor with an RII of 0.4103, poor safety management on site with an RII of 0.3891, industrial action with an RII of 0.3778, shortage of site workers with an RII of 0.3772, adverse weather conditions with an RII of 0.3692, site acquisition problems with an RII of 0.3607, unexpected location difficulty with an RII of 0.3385, site conditions with an RII of 0.3259 and poor site management with an RII of 0.3138. Among these ten variables, lack of motivation to site workers ranks highly in importance in determining the abandonment of a project in the police and health sectors with RII of 0.4906. The variable with lowest rank of importance in the category according to the RII is poor site management with RII of 0.3138.

Table 4.11: RII for Site Related Sub-Attributes: Health and Police Combined

Sub-Attribute	N	RII	RK
Lack of motivation to site workers	117	0.4906	1
Relationship between site workers and contractor	117	0.4103	2
Poor safety management on site	116	0.3891	3
Industrial action	117	0.3778	4
Shortage of site workers	114	0.3773	5
Adverse weather conditions	117	0.3692	6
Site acquisition problems	117	0.3607	7
Unexpected location difficulty	117	0.3385	8
Site conditions	116	0.3259	9
Poor site management	116	0.3139	10
Average		**0.3754**	

4.3.3 Health Sector

Table 4.12 below presents the results based on the RII ranking of the 63 sub-attributes in the health sector only. Lack of prioritization and project portfolio management rank the highest in project abandonment at 0.6487. The second sub-attribute is business politics with RII of 0.5946. These results for the health sector are different from the results obtained if two sectors combine, where vandalism ranked highly in the former case. In the combined analysis, business politics ranked number four in the order of importance with RII of 0.5754, which was lower than the RII in the analysis of the health sector separately. This result shows us that the variable business politics is much more critical in determination of project abandonment in the health sector than for all the two sectors combined. In the analysis, the study found that the sub-attribute litigation was still less in importance in determining project abandonment even for the health sector separated.

Table 4.12: RII for 63 Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Lack of prioritization and project portfolio management	40	0.6487	1
Business politics	40	0.5946	2
Bad decisions	40	0.573	3
Unfavorable government policy	44	0.5568	4
Not meeting end user expectation	40	0.5568	5
Bureaucracy and red tape within project	40	0.546	6
Poor relationship among project team members	40	0.5405	7
Communication and coordination problems	40	0.5405	8
Fraudulent practices and briberies	40	0.5351	9
Inappropriate risk allocation among project team members	38	0.5243	10
Vandalism of works-in progress or finished	40	0.4973	11
Lack of management commitment	40	0.4865	12
Material management problem	40	0.4703	13
Unclear lines of responsibilities	40	0.4541	14
Ignoring project warning signs	40	0.4541	15
Inadequate project feasibility studies	38	0.4487	16
Lack of user input	40	0.4432	17
Financial difficulties faced by contractors	38	0.4378	18
Project control problems	39	0.4378	19
Incompetent consultants	40	0.4378	20
Unavailability of materials and equipment	40	0.427	21
Unskilled/incompetent site workers	40	0.427	22
Inappropriate contract arrangement	39	0.427	23
Difficulty in design	40	0.4216	24
Involvement of large number of project participants	44	0.4216	25
Poor contract administration	40	0.4108	26
Inexperienced client/owner	40	0.4054	27
Poor quality control	40	0.4054	28
Incompetent contractors/sub-contractors	40	0.4	29

Improper construction methods	40	0.4	30
Lack of appropriate dispute resolution methods	39	0.3946	31
Lack of organizational support	39	0.3946	32
Under estimation of project cost	40	0.3838	33
Inappropriate financing	40	0.3784	34
Delays in interim payments	40	0.373	35
Inappropriate project planning and scheduling	45	0.373	36
Poor safety management on site	39	0.373	37
Difficult tender process	38	3622	38
Ambiguity or mistakes in scope of work, specification or drawings	39	0.3622	39
Low labour productivity	39	0.3568	40
Financial difficulties faced by owner	39	0.3514	41
Relationship between site workers and contractor	40	0.3514	42
Inappropriate pricing/incentives of services rendered by contractors	40	0.3456	43
Lack of motivation to site workers	39	0.346	44
Competing priorities	39	0.346	45
Rework due to errors during construction	40	0.3405	46
Misinterpretation of drawings and specifications	40	0.3405	47
Unrealistic time frame and tasks	40	0.3297	48
Conflicts between drawings and specifications	40	0.3297	49
Unexpected economic conditions	40	0.3135	50
Undefined objectives and goals	40	0.3135	51
Industrial action	40	0.3135	52
Problems related to variation orders	40	0.3081	53
Lack of cooperation from local authorities	40	0.3027	54
Poor site management	40	0.2973	55
Site conditions	40	0.2919	56
Negative impact of project to society/environment	40	0.2865	57
Unexpected location difficulty	40	0.2811	58

Shortage of site workers	38	0.2811	59
Site acquisition problems	40	0.2757	60
Adverse weather conditions	40	0.2649	61
Cultural crash among project parties	40	0.2649	62
Litigation	39	0.2432	63

4.3.4 RII based on Attributes: Health Sector

Analysis of the results under the health sector based on the attributes revealed that contract management related sub-attributes ranked highest with an average RII of 0.4728 followed by project planning related sub-attributes with average RII 0.40. Ranking of categories under health sector are as summarized in Table 4.13 below;

Table 4.13: Attribute RII-Health Sector

Attribute	N	RII	RK
Contract management	40	0.4727	1
Project planning	41	0.4	2
Financial	40	0.396	3
Procurement	40	0.3939	4
Community involvement	40	0.3938	5
Workmanship	40	0.392	6
Design	40	0.378	7
Site	40	0.3	8

4.3.4.1 Contract Management Related Sub-Attributes: Health Sector

Health sector respondents ranked the contract related sub-attributes category the highest with RII of 0.4727 based on Table 4.13, the sub-attribute that ranked high in the hierarchy of importance was lack of prioritization by project portfolio management with RII of 0.6487 based on Table 4.14 and this was seconded by business politics with RII of 0.5946. Other sub-attributes in this category include; bad decisions RII of 0.573, bureaucracy and red tape within the project RII of 0.546, Poor relationship among project team members RII of 0.5405, communication and coordination problems RII of 0.5405. The two sub-attributes, communication and coordination problems and poor relationship among project team members have the same hierarchy of importance in the study; this would be expected because poor communication and coordination among the team members would lead to poor relationships among the involved stakeholders in

the project. In contract management, the sub-attribute litigation was the least in the hierarchy of importance with RII of 0.2432, ranking number 14.

Table 4.14: RII and Contract Management Related Sub-Attributes: Health Sector

Sub-Attributes	N	RII	RK
Lack of prioritization and project portfolio management	40	0.6487	1
Business politics	40	0.5946	2
Bad decisions	40	0.573	3
Bureaucracy and red tape within project	40	0.546	4
Poor relationship among project team members	40	0.5405	5
Communication and coordination problems	40	0.5405	6
Lack of management commitment	40	0.4865	7
Material management problem	40	0.4702	8
Ignoring project warning signs	40	0.4541	9
Project control problems	40	0.4378	10
Poor contract administration	40	0.4108	11
Poor quality control	39	0.4054	12
Lack of organizational support	39	0.3946	13
Competing priorities	39	0.346	14
Litigation	39	0.2432	15
Average		**0.4728**	

4.3.4.2 Project Planning Related Sub-Attributes: Health Sector

The second attribute in the hierarchy of importance in the health sector is project planning, this category had an average RII of 0.40 based on Table 4.13. Inappropriate risk allocation ranked highly in importance with an RII of 0.5243 based on Table 4.15. The sub-attribute unclear lines of responsibilities come second in the hierarchy of importance with RII of 0.4541. Other sub-attributes in the category project planning include; inappropriate contract management RII at 0.4270, project planning and scheduling RII at 0.4231, government policy RII at 0.4218, involvement of large number of project participants with RII of 0.4216, lack of appropriate dispute resolution methods RII at 0.3946, project feasibility studies RII at 0.3468, unrealistic time flame and task RII at 0.3297 and the least important sub-attribute of undefined objectives and goals RII at 0.3135.

Table 4.15: RII and Project Planning Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Inappropriate risk allocation	38	0.5243	1
Unclear lines of responsibilities	40	0.4541	2
Inappropriate contract arrangement	39	0.427	3
Project planning and scheduling	45	0.4231	4
Government policy	44	0.4218	5
Involvement of large number of project participants	44	0.4216	6
Lack of appropriate dispute resolutions methods	39	0.3946	7
Project feasibility studies	38	0.3468	8
Unrealistic time frame and tasks	40	0.3297	9
Undefined objectives and goals	40	0.3135	10
Average		**0.4057**	

4.3.4.3 Financial Related Sub-Attributes: Health Sector

The third attribute in the hierarchy of importance based on the RII is financial issues; this category has an aggregate RII of 0.3169 based on Table 4.13. It consists of seven sub-attributes and the highest in the hierarchy of importance is fraudulent practices and briberies with an RII of 0.5351 based on Table 4.16. The other sub-attributes in the category include; financial difficulties faced by contractors RII at 0.4378, underestimation of project costs RII at 0.3838, inappropriate financing with RII of 0.3784, delays in interim payments RII at 0.3730, financial difficulties faced by the owner RII at 0.3514 and unexpected economic conditions with the lowest RII of 0.3135.

Table 4.16: RII and Financial Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Fraudulent practices and briberies	40	0.5351	1
Financial difficulties faced by contractors	38	0.4378	2
Underestimation of project cost	40	0.3838	3
Inappropriate financing	40	0.3784	4
Delays in interim payments	40	0.373	5
Financial difficulties faced by owner	39	0.3514	6
Unexpected economic conditions	40	0.3135	7
Average		**0.3961**	

4.3.4.4 Procurement Related Sub-Attributes: Health Sector

The fourth attribute in the health sector is procurement issues. This attribute has an aggregate RII of 0.3940 based on Table 4.13. It has four sub-attributes under it, which are tender process with an RII of 0.4579, unavailability of materials and equipment with an RII of 0.4270, inappropriate pricing/incentives of services rendered by contractors with an RII of 0.3451 and lastly variation orders with an RII of 0.3451 based on Table 4.17. In this category, the sub-attribute tender process ranks highly in the hierarchy of importance. The sub-attribute variation orders has the lowest ranking in importance in determining the abandonment of a project in the city council as has been found by its lower RII value.

Table 4.17: RII and Procurement Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Tender process	38	0.4579	1
Unavailability of materials and equipment	40	0.427	2
Inappropriate pricing/incentives of services rendered by contractors	40	0.346	3
Variation orders	40	0.3451	4
Average		**0.394**	

4.3.4.5 Community Involvement Related Sub-Attributes: Health Sector

The fifth attribute in the hierarchy of importance in as far as project abandonment is concerned is community involvement. Community involvement is an important attribute because the projects that are initiated by the government are for the benefit of the community in which they are implemented. The category has an aggregate RII of 0.3938 based on Table 4.13. The sub-attributes under this category include; not meeting end user expectation with the highest RII of 0.5568 telling us that it is the most important sub-attribute in determining project abandonment in the category. The other sub-attributes based on Table 4.18 and according to the hierarchy of importance include; vandalism of works-in progress or finished at an RII of 0.4973, lack of user input at an RII of 0.4432, inexperienced client or owner at an RII of 0.4054, lack of corporation from local authorities at an RII of 0.3027, negative impact of project to society at an RII of 0.2865 and cultural crush among parties in the project at an RII of 0.2649.

Table 4.18: RII and Community Involvement Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Not meeting end user expectation	40	0.5568	1
Vandalism of works in progress or finished	40	0.4973	2
Lack of user input	40	0.4432	3
Inexperienced client/owner	40	0.4054	4
Lack of cooperation from local authorities	40	0.3027	5
Negative impact of project to society/environment	40	0.2865	6
Cultural crash among parties in project	40	0.2649	7
Average		**0.3938**	

4.3.4.6 Workmanship Related Sub-Attributes: Health Sector

Next to community involvement in the hierarchy of importance is workmanship. This attribute ranks at number six and has an aggregate RII of 0.3924 based on Table 4.13. The category has five sub-attributes, which include; incompetent consultants with an RII of 0.2135, unskilled/incompetent site workers with an RII of 0.1702, incompetent contractors/subcontractors with an RII of 0.2, low productivity of labor with an RII of 0.1783 and rework due to errors in construction with an RII of 0.1540 based on Table 4.19. The sub-attribute incompetent consultants are the highest in the ranking of importance under the workmanship category.

Table 4.19: RII and Workmanship Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Incompetent consultants	40	0.2135	1
Incompetent contractors and sub-contractors	40	0.2	2
Low productivity of labour	39	0.1783	3
Unskilled/incompetent site workers	40	0.1702	4
Rework due to errors	40	0.154	5
Average		**0.1832**	

4.3.4.7 Design Related Sub-Attributes: Health Sector

The seventh attribute in the hierarchy of importance is design with an average RII of 0.3708 based on Table 4.13. This category comprises of five sub-attributes and the highest among these sub-attributes is difficulty in design with RII of 0.4216 based on Table 4.20. Other sub-attributes under design include; improper construction methods with an RII of 0.4, ambiguities or mistakes in the scope of work, specifications or drawings with an RII of 0.3622, misinterpretation of drawings and specifications with an RII of 0.3405 and conflicts between drawings and specifications with RII of 0.3297 from Table 4.20.

Table 4.20: RII and Workmanship Related Sub-Attributes: Health Sector

Sub Attribute	N	RII	RK
Difficulty in design	40	0.4216	1
Improper construction methods	40	0.4	2
Ambiguities/mistakes in scope of work, specifications or drawings	39	0.3622	3
Misinterpretation of drawings and specifications	40	0.3405	4
Conflicts between drawings and specifications	40	0.3297	5
Average		**0.3708**	

4.3.4.8 Site Related Sub-Attributes: Health Sector

Lastly, under health sector in Lilongwe District Council, the attribute ranks the last in the hierarchy of importance with an aggregate RII of 0.3076 based on Table 4.13. The category has 10 attributes and among these sub-attributes; poor safety management on site is the highest in the hierarchy of importance with an RII of 0.373. Other sub-attributes include; Relationship between site workers and contractor with an RII of 0.3514, lack of motivation to site workers with an RII of 0.346, industrial action with an RII of 0.3135, poor site management with an RII of 0.2973, site conditions with an RII of 0.2919, shortage of site workers with an RII of 0.2811, unexpected location difficulty with an RII of 0.2811, site acquisition problems and adverse weather conditions with an RII of 0.2757 and 0.2649 respectively, all these based on Table 4.21.

Table 4.21: RII and Site Related Sub-Attributes: Health Sector

Sub-Attribute	N	RII	RK
Poor safety management on site	39	0.373	1
Relationship between site workers and contractor	40	0.3514	2
Lack of motivation to site workers	39	0.346	3
Industrial action	40	0.3135	4
Poor site management	40	0.2973	5
Site conditions	40	0.2919	6
Shortage of site workers	38	0.2811	7
Unexpected location difficulty	40	0.2811	8
Site acquisition problems	40	0.2757	9
Adverse weather conditions	40	0.2649	10
Average		**0.3076**	

4.3.5 Police Sector

After analyzing the results of the health sector separately, the RII for 63 factors under the police sector projects were also analyzed. Table 4.22 below presents the ranking of all the attributes in the police sector. According to these results, the unavailability of materials and equipment ranked highly in the hierarchy of importance based on the RII with RII of 0.7. This means that unavailability of materials and equipment is the most important determinant of project abandonment in the police sector in Lilongwe District Council. This sub-attribute is followed by lack of user input which has RII of 0.6645, financial difficulties faced by the owner with an RII of 0.6613. These results are different from the results obtained in the combination of the two sectors where the sub-attribute vandalism of works ranked highly whereas unavailability of

materials and equipment ranked at number three in the hierarchy of importance with RII of 0.5753.

Table 4.22: Police Sector-RII and Sub-attributes

Sub-Attribute	N	RII	RK
Unavailability of materials and equipment	79	0.7	1
Lack of user input	80	0.6645	2
Financial problems faced by owner	79	0.6613	3
Delays in interim payments	79	0.6322	4
Not meeting end user expectation	79	0.6323	5
Vandalism of works-in progress or finished	80	0.6290	6
Financial difficulties faced by contractors	80	0.6258	7
Lack of motivation to site workers	80	0.6161	8
Inappropriate financing	80	0.6129	9
Lack of appropriate dispute resolution methods	79	0.571	10
Difficulty in tender processes	78	0.5581	11
Unfavorable government policy	79	0.5548	12
Poor contract administration	80	0.5484	13
Lack of organizational support	80	0.5387	14
Underestimation of project cost	79	0.5387	15
Business politics	80	0.5323	16
Unexpected economic conditions	79	0.5258	17
Poor relationship among project members	80	0.5129	18
Inappropriate project planning and scheduling	80	0.5065	19
Ignoring project warning signs	80	0.5065	20
Unrealistic time frame and tasks	79	0.5065	21
Inappropriate pricing/incentives of services rendered by contractors	77	0.5032	22
Problems related to variation orders	80	0.5	23
Material management problems	80	0.5	24
Bureaucracy and red tape within the project	79	0.4935	25
Inexperienced client/owner	80	0.4903	26
Project control problems	80	0.4839	27
Poor quality control	80	0.4839	28
Unclear lines of responsibility	80	0.4742	29

Ambiguities or mistakes in scope of work, specifications or drawings	80	0.4645	30
Involvement of large number of project participants	80	0.4613	31
Communication and coordination problems	80	0.4581	32
Relationship between site workers and contractor	80	0.4452	33
Lack of prioritization and project portfolio management	80	0.4452	34
Incompetent contractors/sub-contractors	78	0.4419	35
Undefined objectives and goals	80	0.4387	36
Inappropriate risk allocation among project team members	79	0.4323	37
Lack of management commitment	80	0.429	38
Adverse weather conditions	80	0.4258	39
Shortage of site workers	80	0.4161	40
Poor safety management on site	80	0.4032	41
Bad decisions	80	0.4032	42
Industrial action	80	0.4032	43
Site acquisition problems	80	0.3968	44
Negative impact of project to society/environment	80	0.3968	45
Cultural crash among parties in project	79	0.3968	46
Inappropriate contract arrangement	80	0.3968	47
Fraudulent practices and briberies	80	0.3903	48
Lack of cooperation from local authority	80	0.3871	49
Low productivity of labour	80	0.3871	50
Unexpected location difficulty	80	0.3839	51
Improper construction methods	80	0.3774	52
Inadequate project feasibility studies	80	0.3742	53
Unskilled/incompetent site workers	80	0.3742	54
Difficulty in design	80	0.371	55
Rework due to errors during construction	80	0.3645	56
Incompetent consultants	79	0.3548	57
Conflicts between drawings and specifications	80	0.3355	58
Competing priorities	80	0.3323	59

Site conditions	78	0.3161	60
Litigation	76	0.2968	61
Misinterpretation of drawings and specifications	80	0.2935	62
Poor site management	79	0.2677	63

4.3.5.1 RII based on Sub-Attributes: Police Sector

Similarly, the eight attributes for police sector were analyzed and ranked same order as health sector and the results are as summarized in the Table 4.23 below:

Table 4.23: Attribute RII-Police Sector

Category of Attribute	N	RII	RK
Financial	76	0.5696	1
Procurement	76	0.556	2
Community involvement	76	0.5138	3
Contract management	77	0.4643	4
Project planning	76	0.4532	5
Site	77	0.4074	6
Workmanship	77	0.3845	7
Design	77	0.3707	8

4.3.5.1 Financial Related Sub-Attributes: Police Sector

Under the police sector, this attribute had the highest ranking in importance based on the RII in Table 4.23 with an average RII of 0.5696. For the seven sub-attributes, ranking highly is financial difficulties faced by the owner with an RII of 0.6613. Other sub-attributes include; Delays in interim payments with an RII of 0.6323, financial difficulties faced by contractors with an RII of 0.6258, inappropriate financing with an RII of 0.6129, underestimation of project costs with an RII of 0.5387, unexpected economic conditions with an RII of 0.5258 and fraudulent practices and briberies with an RII of 0.3903 based on Table 4.24 below. Under the police sector, we can see that fraudulent practices and bribes have a lower rank of importance in determining abandonment of a project compared to the health sector. It was interesting to note that financial related sub-attributes were also ranked number one in the analysis of the categories for police and health sectors combined. It is also observed that funding for the police projects under study in this research is from government.

Table 4.24: RII and Financial Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Financial difficulties faced by owner	76	0.6613	1
Delays in interim payments	77	0.6322	2
Financial difficulties faced by contractor	77	0.6258	3
Inappropriate financing	77	0.6129	4
Under-estimation of project cost	75	0.5387	5
Unexpected economic conditions	77	0.5258	6
Fraudulent practices and briberies	76	0.3903	7
Average		**0.5696**	

4.3.5.2 Procurement Related Sub-Attributes: Police Sector

This attribute ranks second in importance of determining project abandonment in the police sector with an average RII of 0.5562 based on Table 4.23. In this attribute out of the four sub-attributes present, unavailability of materials and equipment has the highest ranking of importance with an RII of 0.7. Other sub-attributes include; Tender process with an RII of 0.5432, inappropriate pricing/incentives of services rendered by contractors with an RII of 0.5032, and variation orders with an RII of 0.4782 based on Table 4.25.

Table 4.25: RII and Procurement Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Unavailability of materials and equipment	77	0.7	1
Tender process	74	0.5432	2
Inappropriate pricing/incentives of services rendered by contractors	77	0.5032	3
Variation orders	77	0.4782	4
Average		**0.556**	

4.3.5.3 Community Involvement Related Sub-Attributes: Police Sector

The third attribute in the hierarchy of importance is community involvement with an aggregate RII of 0.5138 based on Table 4.23. The sub-attributes under this attribute include; Lack of user input with an RII of 0.6645, not meeting end user expectation with an RII of 0.6323, vandalism

with an RII of 0.6298, inexperienced client or owner with an RII of 0.4903, negative impact of project to society/environment with an RII of 0.3968, Cultural crash among parties in the project with an RII of 0.3968, and lack of cooperation from local authorities with an RII of 0.3810 based on Table 4.26.

Table 4.26: RII and Community Involvement Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Lack of user input	77	0.6645	1
Not meeting end user expectation	76	0.6323	2
Vandalism of works-in progress or finished	77	0.629	3
Inexperienced client/owner	77	0.4903	4
Negative impact or project to society/environment	76	0.3968	5
Cultural crash among parties in project	76	0.3968	6
Lack of cooperation from local authorities	76	0.3871	7
Average		**0.5138**	

4.3.5.4 Contract Management Related Sub-Attributes: Police Sector

Contract management ranks fourth in the hierarchy of importance with RII of 0.4643 based on Table 4.23. The category has 15 sub-attributes. The sub-attribute poor contract administration has the highest ranking of importance with an RII of 0.5484. Other sub-attributes include; Lack of organizational support with an RII of 0.5387, business politics with an RII of 0.5323, poor relationship among project team members with an RII of 0.5129, ignoring project warning signs with an RII of 0.5065, material management problem with an RII of 0.5, bureaucracy and red tape within the project with an RII of 0.4935, project control problems with an RII of 0.4839, poor quality control problems with an RII of 0.4839, communication and coordination problems with an RII of 0.4581, lack of prioritization and project portfolio management with an RII of 0.4452, lack of management commitment with an RII of 0.4290, bad decisions with an RII of 0.4032, competing priorities with an RII of 0.3323 and litigation with an RII of 0.2968, all these based on Table 4.27

Table 4.27: RII and Contract Management Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Poor contract administration	76	0.5484	1
Lack of organizational support	76	0.5387	2
Business politics	77	0.5323	3
Poor relationship among project team members	77	0.5129	4
Ignoring project warning signs	77	0.5065	5
Material management problem	77	0.5	6
Bureaucracy and red tape within project	77	0.4935	7
Project control problems	77	0.4839	8
Poor quality control	77	0.4839	9
Communication and coordination problems	77	0.458	10
Lack of prioritization and project portfolio management	77	0.4452	11
Lack of management commitment	77	0.429	12
Bad decisions	75	0.4032	13
Competing priorities	76	0.3323	14
Litigation	76	0.2968	15
Average		**0.4643**	

4.3.5.5 Project Planning Related Sub-Attributes: Police Sector

Based on Table 4.23 project planning, site attributes and workmanship are the attributes with the least ranking in the hierarchy with RIIs of 0.4532, 0.4074, and 0.3845 respectively. In project planning, lack of appropriate dispute resolution methods ranked first with an RII of 0.571, followed by unrealistic time frame and tasks at 0.5065, then unclear lines of responsibilities at 0.4742 and in that order with project feasibility studies being the last at 0.3874 in order of importance to project abandonment in the police sector as shown in Table 4.28.

Table 4.28: RII and Project Planning Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Lack of appropriate dispute resolution methods	77	0.571	1
Unrealistic time frame and tasks	76	0.5065	2
Unclear lines of responsibilities	77	0.4742	3
Involvement of large number of project participants	73	0.4613	4
Undefined objectives and goals	77	0.4387	5
Inappropriate risk allocation among project team members	77	0.4323	6
Unfavorable Government policy	72	0.4321	7
Inappropriate project planning and scheduling	72	0.4321	8
Inappropriate contract management	77	0.3968	9
Inadequate project feasibility studies	77	0.3874	10
Average		**0.4532**	

4.3.5.6 Site Related Sub-Attributes: Police Sector

The site sub-attributes are ten altogether with an aggregate RII of 0.4074 based on Table 4.23. With this RII the category ranks number six in the hierarchy of importance in factors determining project abandonment in the police sector in Lilongwe District Council based on the RII. In this category the 'lack of motivation of site workers' tops the hierarchy with an RII of 0.6161; this is seconded by relationship between the site workers and contractor with an RII of 0.4452, adverse weather conditions with an RII of 0.4258. Poor site management is the lesser in importance in determining project abandonment with an RII of 0.2677 as shown in Table 4.29 below.

Table 4.29 : RII and Site Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Lack of motivation to site workers	78	0.6161	1
Relationship between site workers and contractor	77	0.4452	2
Adverse weather conditions	77	0.4258	3
Shortage of site workers	76	0.4161	4
Poor safety management on site	77	0.4032	5
Industrial action	77	0.4032	6
Site acquisition problems	77	0.3968	7
Unexpected location difficulty	77	0.3839	8
Site conditions	76	0.3161	9
Poor site management	76	0.2677	10
Average		**0.4074**	

4.3.5.7 Workmanship Related Sub-Attributes: Police Sector

Attributes ranked workmanship lowly under police sector, i.e., aggregate RII of 0.3845 based on Table 4.23. It has five sub-attributes, namely; include; incompetent consultants with an RII of 0.3548, unskilled/incompetent site workers with an RII of 0.3742, incompetent contractors/subcontractors with an RII of 0.4419, low productivity of labor with an RII of 0.3568 and rework due to errors in construction with an RII of 0.3645 as shown in Table 4.30 below. Incompetent consultants, ranked the highest in importance under workmanship (RII=0.4419).

Table 4.30: RII and Workmanship Related Sub-Attributes: Police Sector

Sub-Attribute	N	RII	RK
Incompetent contractors/sub-contractors	76	0.4419	1
Low productivity of labour	77	0.3871	2
Unskilled/incompetent site workers	77	0.3742	3
Rework due to errors during construction	77	0.3645	4
Incompetent consultants	77	0.3548	5
Average		**0.3845**	

4.3.5.8 Design Related Sub-Attributes: Police Sector

The seventh attribute in the hierarchy of importance is design with an average RII of 0.3707 based on Table 4.23. Ambiguities in scope of work, specifications or drawings with an RII of 0.4115 ranks highest. Other sub-attributes include; improper construction methods with an RII of 0.4076, difficulty with an RII of 0.3538, misinterpretation of drawings and specifications with an RII of 0.3153 and conflicts between drawings and specifications with RII of 0.3653 (Table 4.31).

Table 4.31: RII and Design Related Sub-Attributes: Police Sector

Sub Attribute	N	RII	RK
Ambiguities / mistakes in scope of work, specifications or drawings	77	0.4115	1
Improper construction methods	77	0.4076	2
Conflicts between drawings and specifications	77	0.3653	3
Difficulty in design	77	0.3538	4
Misinterpretation of drawings and specifications	77	0.3153	5
Average		**0.3708**	

4.4 Discussion

As has been analyzed in this section, when the analysis was done for the two combined sectors, the financial related issues ranked highly in importance and this was followed by procurement, contract management, community involvement, project planning, workmanship, site and design issues respectively. When the analysis was done separately for the police sector and health sector, ranking of the categories was found to be different. In the police sector, financial related issues maintained the highest rank in the hierarchy of importance followed by procurement, community involvement, contract management project planning, site, workmanship and design related sub attributes respectively. In the health sector contract management was found to rank highly in the hierarchy of importance followed by project planning, financial, procurement, community involvement, and workmanship, design, and site sub-attributes respectively. Based on the analysis it can be concluded that some sub attributes are critical in determining the abandonment of projects in one sector and yet the same factors can be less critical in another sector of the economy.

Few studies seem to have been conducted in Malawi on the causes or attributes behind project abandonment. Some of the studies to that effect was one done by Chirwa, Samwinga and Shakantu (2011) who looked at 'the timely project delivery: a case study of Malawian educational projects' where the focus was the education sector only. Therefore, as far as this study is concerned it has not been carried out in Malawi; hence it is a contribution to the gap in research as well as literature as far as studies of project abandonment attributes are concerned. An analysis of sub-attributes in Table 4.32 below shows that there is more variation in as far as the most important attributes are concerned across the sectors. Under the health sector for example, contract management attribute (with fifteen sub-attributes) is the highest ranked while the sub-attributes of lack of prioritization and project portfolio management, business politics, bad decisions, bureaucracy and red tape within project, poor relationship among project team members, communication and coordination problems, lack of management commitment and ignoring project warning signs are the only nine (60%) of the first fifteen are within under contract management related sub-attributes. The other six of the fifteen top ranked sub-attributes are either community involvement related or project planning related.

Under the police sector, the financial attribute (with seven sub-attributes) is ranked number one but the sub-attribute ranking indicate that three (43%) (Financial difficulties faced by owner,

delays in interim payments and financial difficulties faced by contractors) of the first seven are financial related sub-attributes. The other four sub-attributes of the top seven are either community involvement related or procurement related sub-attributes. For the police and health sectors combined, the financial attribute (with seven sub-attributes) is also ranked first but sub-attributes ranking shows that only two (29%); financial difficulties faced by contractors and financial difficulties faced by owner. The other five of the top seven are either community involvement related, contract management related or procurement related sub-attributes.

From Table 4.32 below it is clearly showing that two sub-attributes are consistently commanding their importance across the three analyses (police, health, health and police combined). Not meeting user expectation sub-attribute is ranked number 2 in Police and Health and police combined while is ranked number 5 in Health. Vandalism of works-in progress or finished sub-attribute is ranked number 1 in Health and police combined number 6 in health and number 11 in health sector. Lack of user input, financial difficulties faced by contractors, unavailability of materials and equipment and financial difficulties faced by owner are the sub-attributes that are consistent both in police, and police and health combined. Some of these results have been confirmed in the studies by Fugar and Agyakawah-Baah (2010) and Frimpong *et al*. (2003) in Ghana.

Table 4.32: Overall RII and Ranking for Health, Police and Combined Sectors Sub-Attributes

Sub-Attribute	Sectors								
	Health			Police			Health and Police		
	N	RII	RK	N	RII	RK	N	RII	RK
Lack of prioritization and project portfolio management	40	0.6487	1	77	0.4452	34	117	0.5060	14
Business politics	40	0.5946	2	77	0.5323	16	117	0.5744	4
Bad decisions	40	0.573	3	77	0.4032	42	117	0.4718	23
Unfavorable government policy	44	0.5568	4	72	0.4321	12	116	0.5379	9
Not meeting end user expectation	40	0.5568	5	76	0.6323	5	116	0.5793	2
Bureaucracy and red tape within project	40	0.546	6	77	0.4935	25	117	0.5094	13
Poor relationship among project team members	40	0.5405	7	77	0.5129	18	117	0.5026	15
Communication and coordination problems	40	0.5405	8	77	0.4581	32	117	0.4803	21
Fraudulent practices and briberies	40	0.5351	9	76	0.3903	48	116	0.4500	28
Inappropriate risk allocation among project team members	38	0.5243	10	77	0.4323	37	115	0.4557	27
Vandalism of works-in progress or finished	40	0.4973	11	77	0.629	6	117	0.5966	1
Lack of management commitment	40	0.4865	12	77	0.429	38	117	0.4479	32
Material management problem	40	0.4703	13	77	0.5	24	117	0.4872	19
Unclear lines of responsibilities	40	0.4541	14	77	0.4742	29	117	0.4650	25
Ignoring project warning signs	40	0.4541	15	77	0.5065	20	117	0.5145	12
Inadequate project feasibility studies	38	0.4487	16	77	0.3874	53	115	0.4139	41
Lack of user input	40	0.4432	17	77	0.6645	2	117	0.5590	7
Financial difficulties faced by contractors	38	0.4378	18	77	0.6258	7	115	0.5635	6
Project control problems	39	0.4378	19	77	0.4839	27	116	0.4672	24
Incompetent consultants	40	0.4378	20	77	0.3548	57	117	0.3932	46
Unavailability of materials and equipment	40	0.427	21	77	0.7	1	117	0.5744	3
Unskilled/incompetent site workers	40	0.427	22	77	0.3838	54	117	0.4086	43
Inappropriate contract arrangement	39	0.427	23	77	0.3968	47	116	0.4172	40
Difficulty in design	40	0.4216	24	77	0.371	55	117	0.3880	49
Involvement of large number of project participants	44	0.4216	25	73	0.4613	31	117	0.4342	35

Poor contract administration	40	0.4108	26	76	0.5483	13	116	0.5017	16
Inexperienced client/owner	40	0.4054	27	77	0.4903	26	117	0.4342	34
Poor quality control	40	0.4054	28	77	0.4831	28	117	0.4479	31
Incompetent contractors/sub-contractors	40	0.4	29	76	0.4419	35	116	0.4293	36
Improper construction methods	40	0.4	30	77	0.3774	52	117	0.4051	45
Lack of appropriate dispute resolution methods	39	0.3946	31	77	0.571	10	116	0.5362	10
Lack of organizational support	39	0.3946	32	76	0.5387	14	115	0.4783	22
Under estimation of project cost	40	0.3838	33	75	0.5386	15	115	0.4870	20
Inappropriate financing	40	0.3784	34	77	0.6129	9	117	0.5470	8
Delays in interim payments	40	0.373	35	77	0.6332	4	117	0.5333	11
Inappropriate project planning and scheduling	45	0.373	36	72	0.4321	19	117	0.4581	26
Poor safety management on site	39	0.373	37	76	0.4032	41	116	0.3897	48
Difficult tender process	38	0.3622	38	74	0.5432	11	112	0.4893	18
Ambiguity or mistakes in scope of work, specification, drawings	39	0.3622	39	77	0.4645	30	116	0.4207	39
Low labour productivity	39	0.3568	40	77	0.3871	50	116	0.4259	37
Financial difficulties faced by owner	39	0.3514	41	76	0.6613	3	115	0.5739	5
Relationship between site workers and contractor	40	0.3514	42	77	0.4451	33	117	0.4103	42
Inappropriate service pricing/incentives rendered by contractors	40	0.3456	43	77	0.5032	22	117	0.4496	29
Lack of motivation to site workers	39	0.3460	44	78	0.6161	8	117	0.4906	17
Competing priorities	39	0.3460	45	75	0.3322	59	114	0.3526	56
Rework due to errors during construction	40	0.3405	46	77	0.3645	56	117	0.4068	44
Misinterpretation of drawings and specifications	40	0.3405	47	77	0.2935	62	117	0.3316	60
60Unrealistic time frame and tasks	40	0.3297	48	76	0.5065	21	116	0.4448	33
Conflicts between drawings and specifications	40	0.3297	49	77	0.3355	58	117	0.3402	58
Unexpected economic conditions	40	0.3135	50	77	0.5258	17	117	0.4496	30
Undefined objectives and goals	40	0.3135	51	77	0.4387	36	117	0.3932	47
Industrial action	40	0.3135	52	77	0.4032	43	117	0.3778	50
Problems related to variation orders	40	0.3081	53	77	0.4782	23	117	0.4222	38

Lack of cooperation from local authorities	40	0.3027	54	76	0.3871	49	116	0.3707	52
Poor site management	40	0.2973	55	76	0.2677	63	116	0.3138	62
Site conditions	40	0.2919	56	76	0.3161	60	116	0.3259	61
Negative impact of project to society/environment	40	0.2865	57	76	0.3968	45	116	0.3655	54
Unexpected location difficulty	40	0.2811	58	77	0.3838	51	117	0.3385	59
Shortage of site workers	38	0.2811	59	76	0.4161	40	114	0.3772	51
Site acquisition problems	40	0.2757	60	77	0.3968	44	117	0.3607	55
Adverse weather conditions	40	0.2649	61	77	0.3968	46	117	0.3692	53
Cultural crash among project parties	40	0.2649	62	76	0.4258	39	116	0.3510	57
Litigation	39	0.2432	63	76	0.2968	61	115	0.3299	63

In this study, financial attributes tend to top the hierarchy of importance in causing abandonment of projects in the police and both sectors combined. These results are in line with what Muhwezi *et al* (2014) found in their study in Uganda about delays in building construction projects. The authors found that financial related sub attributes had RII of 0.923 rank of importance of factors determining project abandonment. To concur with Muhwezi *et al* (2014), Olesegun and Michael (2011) found that inadequate finance was among the top two highly ranked variables causing abandonment of public projects in Nigeria. The study by Olusegun and Michael (2011) found that inadequate finance had an RII of 0.988, which was seconded by financial sub attributes with inflation RII of 0.984, bankruptcy of contractor with an RII of 0.979. These results by Muhwezi *et al* (2014) and Olusegun and Michael (2011) are in line with the results obtained by this study especially in the analysis of the two sectors combined and the police sector separately.

In Nigeria most project abandonment experienced were due to financial attributes from client (individual, corporate and government). The study findings by Abisuga *et al* (2014) confirm the findings found by the researcher in this study as outlined in Table 4.33 below. Similarly, with reference to Table 4.33, the study ranked procurement attribute second in hierarchy of determining project abandonment with RII=0.4838 for the two sectors combined and RII = 0.556 for Police sector analysed separately. This result of this study is quite similar to findings by other authors like Muhwezi *et al* (2014) who found out that poor procurement of site materials with RII = 0.8 was among the top two highly ranked variables causing abandonment of public projects in Nigeria.

Table 4.33: Overall RII and Ranking for Health, Police and Combined Sectors

Category of Attribute	Sector								
	Health			Police			Health and Police		
	N	RII	RK	N	RII	RK	N	RII	RK
Financial	37	0.396	3	60	0.5696	1	97	0.5149	1
Procurement	37	0.3939	4	67	0.556	2	104	0.4838	2
Contract management	37	0.4727	1	61	0.4643	4	98	0.4694	3
Community involvement	37	0.3938	5	61	0.5138	3	98	0.4654	4
Project planning	37	0.4	2	60	0.4532	5	97	0.4556	5
Workmanship	37	0.392	6	60	0.3845	7	97	0.4127	6
Design	37	0.378	7	69	0.3707	8	106	0.3771	7
Site	37	0.3	8	60	0.4074	6	97	0.3754	8

With reference to Table 4.33 above, attributes of financial, procurement and project planning are consistently ranked 1, 2, and 5 for the Police and both sectors combined with a slight difference for contract management and community involvement attributes. It is however a different case with the health sector analyzed separately; Contract management, project planning, financial, procurement and community involvement in that order. Looking at the three analyses it shows that the top five attributes are the same regardless of their actual ranks. This suggests that despite the variations in rank of the attributes ideally factors contributing to the project abandonment within the Health and Police sectors of Lilongwe District Council are the top five attributes as ranked. Although, many authors in the literature have not analyzed the contract management related sub-attributes, contract management is critical in determining project abandonment. This study found the contract management related attributes to have an RII of 0.4694 for the two sectors combined. Aibinu and Jagboro (2002) in their study confirmed these findings which indicate that business politics, ignoring project warning signs, bureaucracy and red tape within the project, lack of prioritization and project portfolio management as some of the major factors determining the abandonment of public projects being implemented.

Looking at the health sector, contract management attribute turned to be the most important category in determining project abandonment in the health sector; this is different from the result obtained in the combined analysis of police and health sector where financial attribute was found

to top the hierarchy. The difference in these findings might be due to the bureaucratic structure of the two sectors. Although the two sectors are under the government's control, the initiation of projects in them is different. Most of the projects in the health sector are decided by the central government despite the fact that Health is one of the devolved sectors while police sector is not yet devolved. Politicians at district council level most of the times take an initiative to start developmental projects even with inadequate resources in areas where they see that they will obtain more votes.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter offers the conclusion of the study conducted, the recommendations that the author suggests for dealing with the problem of project abandonment in the health and police sectors in Lilongwe District Council.

5.2 Research Conclusions

Project abandonment is because of extended delays and these delays are inevitable, Muhwezi *et al* (2014), however they can be avoided or minimized when their causes are effectively identified and analyzed. The main aim of this study was to investigate the factors leading to the abandonment of public building infrastructure in Malawi, using the police and health sectors of Lilongwe District Council as a case study.

Sixty-three (63) project abandonment sub-attributes were identified and categorized into eight main project abandonment attributes as follows; financial, procurement, contract management, planning, design, site, workmanship and/or community involvement related attributes. The computed RIIs provided a benchmark for ranking all the sub attributes and attributes which consequently formed the basis determining the most significant and insignificant factors in the context of Lilongwe District Council (police and health sectors).

For the police sector, financial attribute ranked highest as the contributing factor to project abandonment while for health sector it was contract management attribute that ranked highest. Further analysis however, revealed that if these two sectors are combined financial attribute ranked highest. This could probably suggest that financial attribute in police is so critical that it has influenced the results (RII=0.396 for health, RII=0.5696 for police) for the two sectors combined. Interestingly, some of the financial sub attributes for instance, financial difficulties faced by owner is more significant in police (RII=0.6613) than in health (RII=0.3514) and eight out of the nine police projects were funded by the Malawi Government while all the health projects under study were adequately funded by development partners. It can therefore be concluded that besides financial resources in projects being critical poor contract management can still lead to project abandonment as has been seen that projects under health though adequately funded were still abandoned due to poor contract management. In other words, each

attribute on its own might not be mutually exclusive in contributing to the abandonment of a project. In fact there are top five attributes that are consistently ranked high across the sectors and the two sectors combined. These five attributes have very high positive relationship in terms of correlation as indicated in Table 3.6. This therefore suggests that the importance of adequate and timely provision of financial resources, good procurement practices, good contract management principles, community involvement and general project planning in building construction project management cannot be overemphasized.

5.3 Research Recommendations

Based on the study results the following recommendations are suggested;

(i). Efforts should be made that adequate financial resources are available before any project is commenced to avoid the scenario of the police projects which were abandoned largely due to financial related problems.

(ii). Project planning process and general contract management should be followed but with the involvement of the community concerned as it has been shown that vandalism of works in progress or finished work and not meeting user expectation sub-attributes ranked highly in contributing project abandonment.

(iii). Lilongwe District Council should always strive to implement projects that have prior approval of the council and are prioritized by management based on its district development plans.

5.4 Suggestions for Further Research

Further research may be required as follows:

(i). The study being a case study only focused on two sectors, that is the health and police sectors so the results may not be externally generalized and thus future studies may consider the other sectors as well.

(ii). Further to that the study was also a case study focusing on only one district council, the Lilongwe District Council whilst Malawi has about 28 district councils. Re-doing the study must as well consider including all the district councils in Malawi to externally generalize the results.

5.5 Research Limitations

The main research limitations were as follows:

(i). Only two sectors, health and police were targeted out of the available thirteen sectors, i.e., education, agriculture, trade, labour, youth and sports, roads, immigration, community development, rural housing, fisheries, water, and irrigation. The results may therefore not be generalized to across the sectors in Lilongwe District.

(ii). Lilongwe District has 18 traditional authorities but this study was done in 9 Traditional Authorities, so the results may not apply to the remaining places

(iii). Being a case study the study focused on Lilongwe District Council out of the twenty-eight councils in Malawi. Therefore, the results may not be externally generalized across the remaining councils.

(iv). Generally, in some study sites there was resentment to participate in the questionnaire. For instance, community respondents at Mpingu Police Unit refused to participate in the pilot on the pretext that to them this was not more beneficial than restarting the abandoned project.

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APPENDICES

Appendix A: Letter to Respondents

Dear Respondent

This survey is part of an academic research study that aims to investigate factors that lead to abandonment of public infrastructure projects in Malawi - A case of Lilongwe District Council specifically Police and Health sectors.

All the information you provide will be kept in strict confidentiality and it will only be used for academic research purposes.

Please answer each question carefully. If you are unsure of the exact answer please respond with your best estimate.

I value your participation and thank you very much for your time, energy and effort. If you have any further questions contact me on the details below.

Yours Sincerely,

Mathews Sahel Lungu,

P.O. Box 93,

Lilongwe.

Tel. 0999299777/0882898555

Email:sahellungu@yahoo.co.uk/sahellungu@gmail.com

Appendix B: Survey Questionnaire (English Version)

***Please insert a corresponding figure in the appropriate columns to indicate how much you agree that the following factors are causes of abandoned projects**

	Project Abandonement Sub Attributes	***Strongly Disagree=1***	***Disagree=2***	***Neither Agree nor Disagree=3***	***Agree = 4***	***Strongly Agree =5***
1	Difficulty of design and construction					
2	Inappropriate risk allocation among project team members					
3	Inappropriate pricing/incentives of services rendered by contractors					
4	Difficult tender process					
5	Ambiguities or mistakes in scope of work, specifications or drawings					
6	Inadequate project feasibility studies					
7	Lack of appropriate dispute resolution methods					
8	Poor Contract Administration					
9	Financial difficulties faced by contractor					
10	Financial difficulties faced by owner					
11	Delays in interim payments					
12	Inappropriate project planning and scheduling					
13	Project Control problems					
14	Bureaucracy and red tape within the project					
15	Site acquisition problems					
16	Adverse weather or acts of God					
17	Unexpected location difficulty					
18	Problems related to variation orders					
19	Involvement of large number of participants in project					
20	Unavailability of materials and equipment					
21	Incompetent contractors / subcontractors					
22	Incompetent consultant					
23	Unskilled/ incompetent site workers					
24	Shortage of site workers					
25	Lack of motivation to site workers					
26	Poor relationship among project team members					

27	Poor safety management on site					
28	Inexperienced client / owner					
29	Negative impact of project to society or environment					
30	Lack of cooperation from local authorities					
31	Unexpected economic conditions					
32	Unfavorable government policy					
33	Cultural crash among parties involved in project					
34	Litigation					
35	Poor quality control					
36	Relationship between site workers and contractor					
37	Fraudulent practices and briberies					
38	Unclear lines of responsibility and authority					
39	Problems of communication and coordination					
40	Inappropriate contract arrangements (community managed/ centrally managed)					
41	Inappropriate financing					
42	Lack of management commitment					
43	Competing priorities					
44	Lack of organizational support					
45	Business politics					
46	Lack of priotization and project portfolio management					
47	Not Meeting end user expectation					
48	Bad decision					
49	Underestimation of projects cost					
50	Poor site management					
51	Site conditions					
52	Ignoring project warning signs					
53	Undefined objectives and goals					
54	Lack of user input					
55	Unrealistic time frames and tasks					
56	Low productivity of labor					
57	Vandalism of works (in progress/ finished)					
58	Industrial action(strike /sit in)					
59	Conflicts between drawingsg and specifications					

60	Rework due to errors during construction					
61	Materials management problems					
62	Misinterpretation of drawings and specifications					
63	Improper construction methods					

Thank you for your time and effort in completing this survey form

We would very much appreciate it if you could provide your contact details in case we need to contact you for further information. Please be rest assured that your identity will be kept confidential and will not be disclosed

Name----------

Company----------

Address----------

Telephone----------

Fax----------Email----------

Appendix C: Survey Questionnaire (Chichewa Version)

***Chonde yankhani mafunso ali munsimu**

	Project Abandonment Sub-Attributes	***Strongly Disagree =1***	***Disagree =2***	***Neither Agree nor Disagree =3***	***Agree = 4***	***Strongly Agree =5***
1	Kuvuta kwa pulani yanyumba ndi mamangidwe					
2	Kusadziwitsa/Kusapatsana moyenera udindo wa amene akuyenera kuyankhapo zovuta zikabwera.					
3	Kuchepa kwa malipiro kwa ogwira ntchito					
4	Ndondomeko yolakwikwa pakupeza ogwira ntchito kapena operekera katundu					
5	Kusamveka bwino ndikusinthasintha kwa zoyenera kupanga pantchito/pulani yanyumba					
6	Kusachita bwino kafukufuku woyambilira pa polojekiti					
7	Kusowa kwa njira zabwino zothetsera mikangano pa polojekiti					
8	Kuyendetsa molakwika mgwirizano wantchito (contract)					
9	Mavuto achuma omwe kontilakitala/ogwira ntchito wakumana nawo					
10	Mavuto achuma omwe mwini wapolojekiti wakumana nawo					
11	Kuchedwa kwa malipiro akontilakitala mkatikati mwapolojekiti					
12	Kusachita bwino ndondomeko yakagwiridwe kantchito/polojekiti					
13	Mavuto okhudza kuyang’anira ndikulamulira zochitika mupolojekiti					
14	Kutalika kwanjira zovomerezera ziganizo mupolojekiti					
15	Mavuto pakupeza malo a polojekiti					
16	Nyengo zovuta ndizobwera mwachilengedwe					
17	Zovuta zosayembekezereka zokhudza malo apolojekiti.					
18	Kusintha kapena kuonjezereka kwantchito kwammisiri					
19	Kugwiritsa ntchito anthu ambiri pa polojekiti					
20	Kusowa kwa zipangizo ndi zida zogwirira ntchito					
21	Kusadziwa ntchito kwa makontalakitala/mmisiri					
22	Kusadziwa ntchito kwa oyang’anira ntchito (Consultant)					
23	Kusadziwa ntchito kwa amisiri olembedwa pa polojekiti pompo					
24	Kuchepa kwa amisiri ogwira ntchito pa polojekiti					

25	Kusowa kwa chilimbikitso/malipiro kwa amisiri olembedwa papolojekiti						
26	Kuchepa kwa mgwirizano waoyang'anira ndikuyendetsa ntchito/polojekiti						
27	Kuchepa kwa njira zoonetsetsa chitetezo pa malo apolojekiti						
28	Kusadziwa zambiri kwa oyang'anira/eni ntchito						
29	Zotsatira zoipa zapolojekiti kudera ndi chilengedwe						
30	Kusowa kwa chidwi cha atsogoleri akudera						
31	Mavuto osayembekezereka okhudza zachuma mdziko						
32	Ndondomeko zosakhala bwino zaboma						
33	Mikangano yokhudza chikhalidwe ndi anthu okhudzidwa pa ntchito/polojekiti						
34	Milandu yakukhoti yokhudza polojekiti						
35	Kusowa kwa ndondomeko zabwino zoonera kagwiridwe kabwino kantchito						
36	Kusagwirizana kapena ubale wapakati pa ogwira ntchito ndi kontilakitala						
37	Mchitidwe waziphuphu ndi Katangale						
38	Kusamveka bwino kwa malire amphamvu zamunthu popanga dziganizo panchito						
39	Mavuto okhudza kulumikizana ndimgwirizano pakati pa okhudzidwa pantchito						
40	Njira zosayenera zoyendetsera mgwirizano wantchito (Contract)						
41	Kupereka mosayenera ndalama zapolojekiti						
42	Kusadzipereka kwa oyendetsa polojekiti						
43	Kukhulana/kuombana kwa zofunika kutsatidwa						
44	Kusowa kwa chithandizo kuchoka kubungwe lothandiza						
45	Ndale zochitika mupolojekiti						
46	Kusowa kwa ndondomeko zabwino zazofunikira kwambiri ndi oyenera kutsogolera						
47	Polojekiti sikukwaniritsa/kufikira zoyembekezera za anthu						
48	Ziganizo zosakhala bwino (zoipa) pa polojekiti						
49	Kuchepetsa ndalama kapena katundu oyenera kupita pa polojekiti						
50	Kusatsata zoyenera pakayendetsedwe kapamalo apolojekiti						

51	Kuipa kwa malo oikapo polojekiti					
52	Kuzengereza pazizindikiro zosonyeza kuti polojekiti ikusokonekera					
53	Kusamveka bwino kwa zolinga zapolojekiti					
54	Kusowa kwa maganizo a wanthu papolojekiti					
55	Kusaika moyenera nthawi yokwaniritsira ntchito					
56	Mnyenyo wa amisiri					
57	Kuononga katundu kapena ntchito yomwe yagwirika					
58	Kunyanyala kwa ogwira ntchito					
59	Kukhulana kwa pulani yamamangidwe anyumba					
60	Kubwereza kwa ntchito pamene zinalakwika					
61	Mavuto okhudza kayendetsedwe kakatundu wapolojekiti					
62	Kutanthauzira molakwika zolembedwa pa pulani yanyumba					
63	Kugwiritsa ntchito njira zolakwika pomanga polojekiti					

Zikomo poyankha mafunso

Dzina la woyankha ----------

Bungwe ----------

Address----------

Telephone----------

Fax----------Email----------

Appendix D: Raw Data: Respondent Scores, RIIs and Mean RIIs

Table D- 1: Respondent Scores: Ukwe Police Unit

	Design	**res 1**	**res 2**	**res 3**	**res 4**	**res 5**	**res 6**	**res 7**	**res 8**	**RII**
1	Difficulty in design	1	1	2	1	1	1	1	1	0.225
5	Ambiguities or mistakes in scope of work, specifications or drawings	5	1	2	1	1	1	1	1	0.325
59	Conflicts between drawingsg and specifications	2	1	2	1	1	1	1	1	0.25
62	Misinterpretation of drawings and specifications	1	1	1	1	1	1	2	1	0.225
63	Improper construction methods	2	2	1	1	1	1	1	1	0.25
										0.255
	Project Planning									
2	Inappropriate risk allocation among project team members	1	3	1	5	5	1		1	0.48571
6	Inadequate project feasibility studies	3	1	2	1	1	1	1	1	0.275
7	Lack of appropriate dispute resolution methods	5	1	1	1	1	1	1	1	0.3
12	Inappropriate project planning and scheduling	2	1	5	2	2	2	2	1	0.425
19	Involvement of large number of project participants	1	1	1	1	4	2	1	1	0.3
32	Unfavourable government policy	3		3	3	3	3	3	2	0.57143
38	Unclear lines of responsibilities	3	3	3	3	3	2	3	1	0.525
40	Inappropriate contract arrangement	3	3	3	3	3	1	3	2	0.525
53	Undefined objectives and goals	1	5	1	5	1	5	1	5	0.6
55	Unrealistic time frame and tasks		1		2	2	1	2	1	0.3
										0.43071
	PROCUREMENT									
3	Inappropriate pricing/incetives of services rendered by contractors	3		5	1	1	1		3	0.46667
4	Difficulty tender process	2	2	2	1	1	1	1	1	0.275
18	Problems related to variation orders	5	2	3	2	3	1	5	2	0.575
20	Unavailability of materials and equipment	4	1	5	4	5	5	4	5	0.825
										0.53542
	Contract Management									
8	Poor contract administration	2	1	1	1	1	1	1	1	0.225
13	Project control problems	1	1	2	1	1	1	1	1	0.225
14	Bureaucracy and Red tape within the project	1	1	1	1	1	1	1	1	0.2

26	Poor relationship among project team members	2	4	2	2	1	2	2	5	0.5
34	Litigation	3	1	4	3	1	4	1	1	0.45
35	Poor quality control	5	3	1	1	3	1	3	4	0.525
39	Communication and coordination problems	1	1	1	1	1	4	2	1	0.3
42	Lack of management commitment	1	1	4	2	4	1	1	2	0.4
43	Competing priorities	2	1	1	1	1	1	1	2	0.25
45	Business politics	3	1	2	3	2	4	2	3	0.5
46	Lack of prioritisation and project portfolio management	2	3	1	1	1	3	1	1	0.325
48	Bad decisions	2	1	1	4	1	5	1	2	0.425
52	Ignoring project warning signs	4	5	4	4	4	5	5	4	0.875
61	Material management problem	1	1	1	1	1	1	1	1	0.2
										0.38571
	Financial									
9	Financial difficulties faced by contractors	4	1	1	1	4	1	4	4	0.5
10	Financial difficulties faced by owner	3		4	5	4	4	4	4	0.8
11	Delays in interim payments	1	1	4	1	5	1		4	0.48571
31	Unexpected economic conditions	3		2	1	3	2	3	2	0.45714
37	Fraudulent practices and briberies	1	1	1	2	1	5	1	2	0.35
41	Inappropriate financing	3	3	3	3	3	4	3	1	0.575
49	under-estimation of project cost	3	3	1	1	3	2	3	3	0.475
										0.52041
	Site									
15	Site acquisition problems	1	1	1	1	1	1	1	1	0.2
16	Adverse weather conditions	5	5	1	5	5	2	5	2	0.75
17	Unexpected location difficulty	1	5	1	1	1	1	1	3	0.35
24	Shortage of site workers	5	4	4	1	4	4	1	2	0.625
25	Lack of motivation to site workers	2	4	1	4	1	2	1	4	0.475
27	Poor safety management on site	4	5	2	4	2	5	4	1	0.675
36	Relationship between site workers and contractor	3	4	1	3	3	4	4	4	0.65
50	Poor site management	1	1	1	1	1	1	1	2	0.225
51	Site conditions	5	5	1	1	1	1	1	1	0.4
58	Industrial action	5	1	1	1	4	4	4	5	0.625
										0.4975
	Workmanship									
21	Incompentent contractors / subcontractors	4		4	5	4	1	4	4	0.74286
22	Incompentent consultants	4	1	4	1	4	1	4	1	0.5

23	Unskilled / incompetent site workers	5	4	4	1	4	4	1	2	0.625
28	Inexperienced client/owner	4	4	1	5	4	4	4	2	0.7
60	Rework due to errors during construction	2	2	1	2	2	1	2	2	0.35
										0.58357
	Community Involvemnt									
29	negative impact of project to society/environment	5	5	1	1	2	5	2	4	0.625
30	Lack of cooperation from local authorities	2	4	2	1	1	1	1	1	0.325
33	Cultural crash among parties in project	4	3	3	3	4	3	3	4	0.675
44	Lack of organisational support	3	3	3	3	3	1	3	3	0.55
47	Not meeting end user expectation	5	5	5	5	5	4	5	5	0.975
54	Lack of user input	1	1	1	1	1	4	1	4	0.35
56	Low productivity of labour	2	1	2	4	3	1	2	1	0.4
57	Vandalism of works - in progress or finished	5	5	5	5	5	5	5	5	1
										0.6125

Table D- 2: Respondent Scores: Nsaru Police Unit

	Design									
1	Difficulty in design	2	1	1	2	2	2	2	1	0.325
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1	2	2	1	2	2	1	0.3
59	Conflicts between drawings and specifications	2	2	2	1	1	2	2	2	0.35
62	Misinterpretation of drawings and specifications	1	1	2	1	2	2	1	2	0.3
63	Improper construction methods	3	3	4	3	5	5	3	4	0.75
										0.405
	Project Planning									
2	Inappropriate risk allocation to project team members	1	1	1	1	2	2	1	1	0.25
6	Inadequate project feasibility studies	2	2	2	1	1	2	1	2	0.325
7	Lack of appropriate dispute resolution methods	4	5	4	4	5	4	5	4	0.875
12	Inappropriate project planning and scheduling	4	5	4	3	4	4	4	4	0.8
19	Involvement of large number of project participants	4	4	5	4	4	4	4	4	0.825
32	Unfavourable government policy	5	4	4	4	5	4	4	5	0.875
38	Unclear lines of responsibilities	3	3	3	3	3	3	3	3	0.6
40	Inappropriate contract arrangement	3	3	3	3	1	3	3	3	0.55
53	Undefined objectives and goals	4	3	4	3	1	4	4	4	0.675
55	Unrealistic time frame and tasks	3	3	3	3	3	3	3	3	0.6
										0.638
	Procurement									
3	Inappropriate pricing/incentives of services bcontractors	4	4	4	4	4	4	4	4	0.8
4	Difficulty tender process	5	5	5	5	5	5	5	5	1
18	Problems related to variation orders	4	4	4	5	4	4	5	4	0.85
20	Unavailability of materials and equipment	5	4	4	4	4	4	1	4	0.75
										0.85
	Contract Management									
8	Poor contract administration	5	4	4	4	4	4	4	5	0.85
13	Project control problems	4	5	4	4	4	4	4	4	0.825
14	Bureaucracy and Red tape within the project	4	5	4	4	4	4	4	5	0.85
26	Poor relationship among project team members	5	5	4	5	4	4	5	5	0.925
34	Litigation	4	2	1	5	1	2	4	2	0.525
35	Poor quality control	3	3	3	3	3	4	3	3	0.625
39	Communication and coordination problems	4	5	5	4	4	4	5	5	0.9
42	Lack of management commitment	2	1	1	1	1	2	2	1	0.275
43	Competing priorities	1	2	1	2	2	2	1	2	0.325
45	Business politics	4	5	4	4	5	4	5	5	0.9
46	Lack of prioritisation and project portfolio management	4	4	4	4	4	4	4	4	0.8
48	Bad decisions	4	4	4	5	4	4	4	5	0.85
52	Ignoring project warning signs	2	1	1	1	2	2	1	2	0.3

61	Material management problem	4	4	4	4	4	4	4	4	0.8
										0.696
	Financial									
9	Financial difficulties faced by contractors	4	4	4	4	4	4	4	4	0.8
10	Financial difficulties faced by owner	4	4	4	4	4	4	4	4	0.8
11	Delays in interim payments	5	4	4	5	5	4	5	4	0.9
31	Unexpected economic conditions	4	2	4	4	4	4	4	4	0.75
37	Fraudulent practices and briberies	1	2	2	1	2	2	1	2	0.325
41	Inappropriate financing	5	5	5	5	5	4	5	5	0.975
49	under-estimation of project cost	2		4	4	5	4	4	4	0.675
										0.746
	Site									
15	Site acquisition problems	5	5	5	5	5	5	5	5	1
16	Adverse weather conditions	4	5	5	4	5	4	4	5	0.9
17	Unexpected location difficulty	4	4	4	4	4	4	4	4	0.8
24	Shortage of site workers	2	2	2	1	2	2	4	2	0.425
25	Lack of motivation to site workers	4	4	4	4	4	4	4	4	0.8
27	Poor safety management on site	1	1	1	2	1	2	5	1	0.35
36	Relationship between site workers and contractor	2	1	1	2	1	4	2	2	0.375
50	Poor site management	1	2	1	1	1	2	2	2	0.3
51	Site conditions	1	2	1	2	1	2	2	2	0.325
58	Industrial action	1	1	1	2	2	2	1	2	0.3
										0.558
	Workmanship									
21	Incompentent contractors / subcontractors	2	2	1	1	1	2	2	1	0.3
22	Incompentent consultants	1	2	2	2	1	2	5	1	0.4
23	Unskilled / incompetent site workers	1	1	1	2	1	2	3	1	0.3
28	Inexperienced client/owner	4	4	4	4	4	4	4	5	0.825
60	Rework due to errors during construction	4	4	4	3	4	4	4	4	0.775
										0.52
	Community Involvement									
29	negative impact of project to society/environment	3	3	3	3	3	2	3	3	0.575
30	Lack of cooperation from local authorities	1	1	1	1	2	2	1	1	0.25
33	Cultural crash among parties in project	2		1	1	1	2	1	2	0.28571
44	Lack of organisational support	4	4	4	4	4	4	4	4	0.8
47	Not meeting end user expectation	1	4	1	1	1	2	1	1	0.3
54	Lack of user input	4	4	4	5	4	4	5	5	0.875
56	Low productivity of labour	1	2	1	2	2	2	2	2	0.35
57	Vandalism of works - in progress or finished	2	1	2	1	1	2	2	2	0.325
										0.470

Table D- 3: Respondent Scores: Mpingu Police Unit

	Design	res 1	RII
1	Difficulty in design	2	0.4
5	Ambiguities or mistakes in scope of work, specifications or drawings	3	0.6
59	Conflicts between drawings and specifications	2	0.4
62	Misinterpretation of drawings and specifications	1	0.2
63	Improper construction methods	3	0.6
			0.44
	Project Planning		
2	Inappropriate risk allocation among project team members	1	0.2
6	Inadequate project feasibility studies	3	0.6
7	Lack of appropriate dispute resolution methods	2	0.4
12	Inappropriate project planning and scheduling	2	0.4
19	Involvement of large number of project participants	2	0.4
32	Unfavourable government policy	3	0.6
38	Unclear lines of responsibilities	2	0.4
40	Inappropriate contract arrangement	3	0.6
53	Undefined objectives and goals	1	0.2
55	Unrealistic time frame and tasks	3	0.6
			0.44
	Procurement		
3	Inappropriate pricing/incetives of services rendered by contractors	1	0.2
4	Difficulty tender process	3	0.6
18	Problems related to variation orders	3	0.6
20	Unavailability of materials and equipment	5	1
			0.6
	Contract Mangement		
8	Poor contract administration	4	0.8
13	Project control problems		0
14	Bureaucracy and Red tape within the project	3	0.6
26	Poor relationship among project team members	1	0.2
34	Litigation	1	0.2
35	Poor quality control	5	1
39	Communication and coordination problems	1	0.2
42	Lack of management commitment	1	0.2
43	Competing priorities	2	0.4
45	Business politics	3	0.6
46	Lack of prioritisation and project portfolio management	2	0.4
48	Bad decisions	1	0.2
52	Ignoring project warning signs	3	0.6
61	Material management problem	3	0.6

			0.429
	Financial		
9	Financial difficulties faced by contractors	2	0.4
10	Financial difficulties faced by owner	3	0.6
11	Delays in interim payments	3	0.6
31	Unexpected economic conditions	3	0.6
37	Fraudulent practices and briberies	3	0.6
41	Inappropriate financing	3	0.6
49	under-estimation of project cost	3	0.6
			0.571
	Site		
15	Site acquisition problems	1	0.2
16	Adverse weather conditions	1	0.2
17	Unexpected location difficulty	1	0.2
24	Shortage of site workers	2	0.4
25	Lack of motivation to site workers	2	0.4
27	Poor safety management on site	1	0.2
36	Relationship between site workers and contractor	2	0.4
50	Poor site management	2	0.4
51	Site conditions	2	0.4
58	Industrial action	2	0.4
			0.32
	Workmanship		
21	Incompentent contractors / subcontractors	2	0.4
22	Incompentent consultants	3	0.6
23	Unskilled / incompetent site workers	2	0.4
28	Inexperienced client/owner	3	0.6
60	Rework due to errors during construction	2	0.4
			0.48
	Community Involvement		
29	negative impact of project to society/environment	1	0.2
30	Lack of cooperation from local authorities	2	0.4
33	Cultural crash among parties in project	1	0.2
44	Lack of organisational support	3	0.6
47	Not meeting end user expectation	3	0.6
54	Lack of user input	1	0.2
56	Low productivity of labour	3	0.6
57	Vandalism of works - in progress or finished	3	0.6
			0.425

Table D- 4: Respondent Scores: Kang'oma Police

	Design		res 2	es 3	re s4	re s5	res 6	res 7	res 8	RII
1	Difficulty in design	3	4	5	2	1	3	3	1	0.4889
5	Ambiguities or mistakes in scope of work, specifications or drawings	2	4	4	3	3	5	5	1	0.6000
59	Conflicts between drawings and specifications	3	4	4	1	2	2	2	4	0.4889
62	Misinterpretation of drawings and specifications	4	5	4	1	1	1	1	1	0.4000
63	Improper construction methods	5	5	2	2	2	2	2	1	0.4667
										0.4890
	Project Planning									
2	Inappropriate risk allocation among project team members	4	3	4	4	5	5	4	1	0.6667
6	Inadequate project feasibility studies	1	4	5	3	4	1	2	1	0.4667
7	Lack of appropriate dispute resolution methods		5	2	4	5	4	4	1	0.6250
12	Inappropriate project planning and scheduling	5	5	2	1	2	3	5	1	0.5333
19	Involvement of large number of project participants	5	5	1	4	3	3	5	1	0.6000
32	Unfavourable government policy	5	5	2	3	1	1	1	4	0.4889
38	Unclear lines of responsibilities	4	1	2	4	5	3	2	1	0.4889
40	Inappropriate contract arrangement	5	5	2	2	2	5	1	1	0.5111
53	Undefined objectives and goals	2	5	2	5	2	2	1	1	0.4444
55	Unrealistic time frame and tasks	5	5	4	4	1	4	1	4	0.6222
										0.5447
	Procurement									
3	Inappropriate pricing/incetives of services rendered by contractors	1	4	2	3	4	4	2	1	0.4667
4	Difficulty tender process			5	5	4	3	3	1	0.6000
18	Problems related to variation orders	2	4	4	2	1	1	5	5	0.5333
20	Unavailability of materials and equipment	4	1	4	3	2	4	5	5	0.6222
										0.5556
	Community Involvement									
8	Poor contract administration	1	3	4	5	5	1	5	1	0.5556
13	Project control problems	4	2	2	4	5	2	5	1	0.5556
14	Bureaucracy and Red tape within the project	5	2	5	1	3	4	5	1	0.5778
26	Poor relationship among project team members	5	4	2	5	1	1	2	1	0.4667
34	Litigation	1	1	1	3	1	1	2	1	0.2444
35	Poor quality control	3	1	4	4	3	1	2	1	0.4222

39	Communication and coordination problems	4	5	2	1	3	4	1	1	0.4667
42	Lack of management commitment	4	5	2	2	1	2	5	1	0.4889
43	Competing priorities		5	2	1	3	1	5	1	0.4000
45	Business politics	4	1	2	1	1	1	1	1	0.2667
46	Lack of prioritisation and project portfolio management	4	5	2	2	1	2	4	1	0.4667
48	Bad decisions	1	5	4	2	2	1	1	1	0.3778
52	Ignoring project warning signs	5	5	2	1	2	1	1	1	0.4000
61	Material management problem	2	4	2	3	3	4	5	1	0.5333
										0.4444
	Financial									
9	Financial difficulties faced by contractors	2	3	1	3	1	1	5	1	0.3778
10	Financial difficulties faced by owner	1	1	1	5	5	1	4	1	0.4222
11	Delays in interim payments	4	4	2	3	3	2	5	1	0.5333
31	Unexpected economic conditions	4	1	4	2	1	2	1	5	0.4444
37	Fraudulent practices and briberies	3	4	2	5	2	1	1	1	0.4222
41	Inappropriate financing	3	1	4	2	1	4	2	4	0.4667
49	under-estimation of project cost		1	4	1	3	2	4	1	0.4000
										0.4381
	Site									
15	Site acquisition problems	1	1	1	1	1	1	4	1	0.2444
16	Adverse weather conditions	3	3	2	1	1	2	5	1	0.4000
17	Unexpected location difficulty	2	2	1	1	1	1	3	1	0.2667
24	Shortage of site workers	4	5	1	4	5	4	5	1	0.6444
25	Lack of motivation to site workers	5	5	2	4	2	2	5	1	0.5778
27	Poor safety management on site	4	5	2	5	5	1	1	1	0.5333
36	Relationship between site workers and contractor	4	5	2	2	1	2	1	1	0.4000
50	Poor site management		2	2	1	1	1	1	1	0.2250
51	Site conditions		1	2	1	1	1	5	1	0.3000
58	Industrial action	4	1	2	4	2	4	1	1	0.4222
										0.4014
	Workmanship									
21	Incompentent contractors / subcontractors	4	5	2	2	5	5	4	1	0.6222
22	Incompentent consultants	2	5	4	4	4	1	1	1	0.4889
23	Unskilled / incompetent site workers	4	5	1	2	1	5	1	1	0.4444
28	Inexperienced client/owner	5	1	2	5	4	1	5	1	0.5333
60	Rework due to errors during construction	5	1	2	1	1	4	1	1	0.3556
										0.4889
	Community Involvement									
29	negative impact of project to society/environment	3	2	2	1	1	2	1	1	0.2889

30	Lack of cooperation from local authorities	5	5	2	1	3	1	5	1	0.5111
33	Cultural crash among parties in project	2	1	2	1	1	1	1	1	0.2222
44	Lack of organisational support	3	2	4	5	2	4	5	1	0.5778
47	Not meeting end user expectation	2	4	4	3	1	4	1	1	0.4444
54	Lack of user input	5	5	4	5	2	2	2	1	0.5778
56	Low productivity of labour	4	4	2	3	1	4	4	1	0.5111
57	Vandalism of works - in progress or finished	5	5	2	2	1	4	1	1	0.4667
										0.4500

Table D- 5: Respondent Scores: Chitekwere Police Unit

	Design	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**RII**
1	Difficulty in design	1	1	1	5	5	1	3	0.4857
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1	2	2	2	2	1	0.3143
59	Conflicts between drawings and specifications	1	1	2	1	1	1	2	0.2571
62	Misinterpretation of drawings and specifications	1	1	2	3	3	1	1	0.3429
63	Improper construction methods	1	1	1	3	3	2	2	0.3714
									0.3543
	Project Planning								
2	Inappropriate risk allocation among project team members	5	5	4	2	2	2	4	0.6857
6	Inadequate project feasibility studies	1	1	2	1	1	4	2	0.3429
7	Lack of appropriate dispute resolution methods	5	5	1	3	3	1	4	0.6286
12	Inappropriate project planning and scheduling	5	5	4	5	5	4	4	0.9143
19	Involvement of large number of project participants	1	1	2	1	1	1	1	0.2286
32	Unfavourable government policy	4	4	1	4	4	1	1	0.5429
38	Unclear lines of responsibilities	1	1	1	5	2	2	3	0.4286
40	Inappropriate contract arrangement	1	1	2	2	5	1	1	0.3714
53	Undefined objectives and goals	1	1	2	1	1	1	3	0.2857
55	Unrealistic time frame and tasks	1	1	4	1	1	4	4	0.4571
									0.4886
	Procurement								
3	Inappropriate pricing/incetives of services rendered by contractors	1	1	2	3	3	3	1	0.4000
4	Difficulty tender process	1	1	2	5	5	2	4	0.5714
18	Problems related to variation orders	4	4	4	3	3	2	4	0.6857
20	Unavailability of materials and equipment	2	2	2	4	4	1	5	0.5714
									0.5571
	Contract management								
8	Poor contract administration	1	1	4	4	4	4	2	0.5714
13	Project control problems	1	1	4	2	2	2	1	0.3714
14	Bureaucracy and Red tape within the project	1	1	2	5	5	1	5	0.5714
26	Poor relationship among project team members	1	1	2	3	3	2	3	0.4286
34	Litigation	1	1	2	1	1	1	1	0.2286
35	Poor quality control	1	1	1	3	3	2	4	0.4286
39	Communication and coordination problems	1	1	2	5	1	2	5	0.4857

42	Lack of management commitment	1	1	4	2	2	4	2	0.4571
43	Competing priorities	1	1	2	1	1	2	2	0.2857
45	Business politics	1	1	4	1	1	2	1	0.3143
46	Lack of prioritisation and project portfolio management	1	1	1	2	2	1	5	0.3714
48	Bad decisions	1	1	1	1	1	1	1	0.2000
52	Ignoring project warning signs	4	4	2	1	1	3	5	0.5714
61	Material management problem	1	1	2	2	2	3	4	0.4286
									0.4082
	Financial								
9	Financial difficulties faced by contractors	5	5	2	1	1	3	2	0.5429
10	Financial difficulties faced by owner	3	3	2	3	3	2	4	0.5714
11	Delays in interim payments	5	5	4	2	2	2	5	0.7143
31	Unexpected economic conditions	5	5	4	5	5	2	4	0.8571
37	Fraudulent practices and briberies	1	1	4	1	1	3	2	0.3714
41	Inappropriate financing	5	5	4	1	5	4	4	0.8000
49	under-estimation of project cost	5	5	2	5	5	2	4	0.8000
									0.6653
	Site								
15	Site acquisition problems	1	1	2	1	1	1	1	0.2286
16	Adverse weather conditions	1	1	2	1	1	1	1	0.2286
17	Unexpected location difficulty	1	1	5	1	1	1	1	0.3143
24	Shortage of site workers	1	1	2	1	1	1	4	0.3143
25	Lack of motivation to site workers	5	5	4	5	5	4	5	0.9429
27	Poor safety management on site	1	1	4	1	1	2	5	0.4286
36	Relationship between site workers and contractor	1	1	4	1	1	1	1	0.2857
50	Poor site management	1	1	2	2	1	2	2	0.3143
51	Site conditions	1	1	2	1	2	1	1	0.2571
58	Industrial action	1	1	4	2	2	4	1	0.4286
									0.3743
	Workmanship								
21	Incompentent contractors / subcontractors	1	2	4	2	2	1	2	0.4000
22	Incompentent consultants	1	2	4	1	1	1	1	0.3143
23	Unskilled / incompetent site workers	1	1	4	2	2	1	4	0.4286
28	Inexperienced client/owner	1	1	4	2	2	1	4	0.4286
60	Rework due to errors during construction	1	1	2	1	1	1	2	0.2571
									0.3657
	Community Involvement								
29	negative impact of project to society/environment	1	1	2	1	1	2	2	0.2857
30	Lack of cooperation from local authorities	4	4	4	1	1	4	1	0.5429
33	Cultural crash among parties in project	5	5	4	1	1	1	5	0.6286
44	Lack of organisational support	1	1	2	3	3	2	2	0.4000

47	Not meeting end user expectation	1	1	2	2	2	1	1	0.2857
54	Lack of user input	1	1	1	2	2	2	4	0.3714
56	Low productivity of labour	1	1	4	2	2	4	1	0.4286
57	Vandalism of works - in progress or finished	1	1	4	1	1	3	2	0.3714
									0.4143

Table D- 6: Respondent Scores: Mapembe Police Unit

	Design	res 1	res 2	es 3	re s4	re s5	res 6	res 7	res 8	RII
1	Difficulty in design	1	1	1	1	1	1	1	1	0.2
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1	1	1	1	1	1	1	0.2
59	Conflicts between drawingsg and specifications	1	1	1	1	1	1	1	1	0.2
62	Misinterpretation of drawings and specifications	1	1	1	1	1	1	1	1	0.2
63	Improper construction methods	1	1	1	1	1	1	1	1	0.2
										0.2
	Project Planning									
2	Inappropriate risk allocation among project team members	1	1	1	1	1	1	1	1	0.2
6	Inadequate project feasibility studies	1	5	1	1	1	1	1	1	0.3
7	Lack of appropriate dispute resolution methods	2	1		5	5	5	5	5	0.7
12	Inappropriate project planning and scheduling	1	1	1	1	1	1	1	1	0.2
19	Involvement of large number of project participants	1	1	1	1	1	1	1	1	0.2
32	Unfavourable government policy	1	1	1	1	1	1	1	1	0.2
38	Unclear lines of responsibilities	1	1	1	1	1	1	1	1	0.2
40	Inappropriate contract arrangement	1	1	1	1	1	1	1	1	0.2
53	Undefined objectives and goals	1	1	1	1	1	1	1	1	0.2
55	Unrealistic time frame and tasks	1	1	1	1	1	1	1	1	0.2
										0.26
	Procurement									
3	Inappropriate pricing/incentives of services rendered by contractors	1	1	1	1	1	1	1	1	0.2
4	Difficulty tender process	1	1	1	1	1	1	1	1	0.2
18	Problems related to variation orders	1	1	1	1	1	1	1	1	0.2
20	Unavailability of materials and equipment	1	1	1	1	1	1	1	1	0.2
										0.2
	Contract management									
8	Poor contract administration	1	1	1	1	1	1	1	1	0.2
13	Project control problems	1	1	1	1	1	1	1	1	0.2
14	Bureaucracy and Red tape within the project	1	1	1	1	1	1	1	1	0.2
26	Poor relationship among project team members	1	1	1	1	1	1	1	1	0.2
34	Litigation	1	1	1	1	1	1	1	1	0.2
35	Poor quality control	1	1	1	1	1	1	1	1	0.2

39	Communication and coordination problems	1	1	1	1	1	1	1	1	0.2
42	Lack of management commitment	1	1	1	1	1	1	1	1	0.2
43	Competing priorities	1	1	1	1	1	1	1	1	0.2
45	Business politics	4	4	4	4	4	4	4	4	0.8
46	Lack of prioritisation and project portfolio management	1	1	1	1	1	1	1	1	0.2
48	Bad decisions	1	1	1	1	1	1	1	1	0.2
52	Ignoring project warning signs	4	4	4	4	4	4	4	4	0.8
61	Material management problem	1	1	1	1	1	1	1	1	0.2
										0.286
	Financial									
9	Financial difficulties faced by contractors	1	4	1	1	1	1	1	1	0.275
10	Financial difficulties faced by owner	4	1	4	4	4	4	4	4	0.725
11	Delays in interim payments	1	1	1	1	1	1	1	1	0.2
31	Unexpected economic conditions	1	1	1	1	1	1	1	1	0.2
37	Fraudulent practices and briberies	1	1	1	1	1	1	1	1	0.2
41	Inappropriate financing	4	4	4	4	4	4	4	4	0.8
49	under-estimation of project cost	1	1	1	1	1	1	1	1	0.2
	Site									**0.371**
15	Site acquisition problems	1	1	1	1	1	1	1	1	0.2
16	Adverse weather conditions	1	1	1	1	1	1	1	1	0.2
17	Unexpected location difficulty	1	1	1	1	1	1	1	1	0.2
24	Shortage of site workers	1	1	1	1	1	1	1	1	0.2
25	Lack of motivation to site workers	1	1	1	1	1	1	1	1	0.2
27	Poor safety management on site	1	1	1	1	1	1	1	1	0.2
36	Relationship between site workers and contractor	1	1	1	1	1	1	1	1	0.2
50	Poor site management	1	1	1	1	1	1	1	1	0.2
51	Site conditions	1	1	1	1	1	1	1	1	0.2
58	Industrial action	1	1	1	1	1	1	1	1	0.2
										0.2
	Workmanship									
21	Incompentent contractors / subcontractors	1	1	1	1	1	1	1	1	0.2
22	Incompentent consultants	1	1	1	1	1	1	1	1	0.2
23	Unskilled / incompetent site workers	1	1	1	1	1	1	1	1	0.2
28	Inexperienced client/owner	1	1	1	1	1	1	1	1	0.2
60	Rework due to errors during construction	4	4	4	4	4	4	4	4	0.8
										0.32
	Community Involvement									
29	negative impact of project to society/environment	1	1	1	1	1	1	1	1	0.2

30	Lack of cooperation from local authorities	1	1	1	1	1	1	1	1	0.2
33	Cultural crash among parties in project	1	1	1	1	1	1	1	1	0.2
44	Lack of organisational support	1	1	1	1	1	1	1	1	0.2
47	Not meeting end user expectation	1	1	1	1	1	1	1	1	0.2
54	Lack of user input	1	1	1	1	1	1	1	1	0.2
56	Low productivity of labour	4	4	4	4	4	4	4	4	0.8
57	Vandalism of works - in progress or finished	4	4	4	4	4	4	4	4	0.8
										0.35

Table D- 7: Respondent Scores: Nsundwe Police

	Design	res 1	res 2	es 3	re s4	re s5	res 6	res 7	res 8	RII
1	Difficulty in design	1	1		1	1	1	3	1	0.2571
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1		1	1	1	3	3	0.3143
59	Conflicts between drawingsg and specifications	1	1		1	2	1	1	2	0.2571
62	Misinterpretation of drawings and specifications	2	1		1	2	1	1	2	0.2857
63	Improper construction methods	2	1		1	2	1	1	2	0.2857
										0.2800
	Project Planning									
2	Inappropriate risk allocation among project team members	1	1		1	1	1	3	1	0.2571
6	Inadequate project feasibility studies	4	1		1	4	1	3	1	0.4286
7	Lack of appropriate dispute resolution methods	1	1		1	2	1	3	1	0.2857
12	Inappropriate project planning and scheduling	2	1		1	2	1	1	1	0.2571
19	Involvement of large number of project participants	4	1		1	4	1		2	0.3714
32	Unfavourable government policy	3	4		1	5	1	1	2	0.4857
38	Unclear lines of responsibilities	2	3		1	2	1	1	2	0.3429
40	Inappropriate contract arrangement	1	1		1	2	1	1	2	0.2571
53	Undefined objectives and goals	2	5		1	1	1	1	1	0.3429
55	Unrealistic time frame and tasks	2	1		1	1	1	4	1	0.3143
										0.3343
	Procurement									
3	Inappropriate pricing/incetives of services rendered by contractors	4			1	2	1	3	1	0.4000
4	Difficulty tender process	2	1		1	5	1	3	2	0.4286
18	Problems related to variation orders	1	5		1	1	1		1	0.2857
20	Unavailability of materials and equipment	1			1	1	1	4	2	0.3333
										0.3619
	Contract Management									
8	Poor contract administration	2	1		1	4	1	5	1	0.4286
13	Project control problems	2	4		1	4	1	3	1	0.4571
14	Bureaucracy and Red tape within the project	1			1	1	1	3	1	0.2667
26	Poor relationship among project team members	1	1		1	1	1	2	1	0.2286
34	Litigation	1	1		1	1	1	1	2	0.2286
35	Poor quality control	1	1		1	1	1	1	2	0.2286

39	Communication and coordination problems	1	1		1	2	1	1	2	0.2571
42	Lack of management commitment	4	1		1	4	1	1	2	0.4000
43	Competing priorities	1	1		1	1	1	1	2	0.2286
45	Business politics	2			1	4	1	1	2	0.3143
46	Lack of prioritisation and project portfolio management	2	1		1	2	1	1	2	0.2857
48	Bad decisions	1	1		1	3	1	1	1	0.2571
52	Ignoring project warning signs	2	4		1	2	1	1	2	0.3714
61	Material management problem	2	1		1	2	1	1	2	0.2857
										0.3027
	Financial									
9	Financial difficulties faced by contractors	1	5		5	5	1	5	4	0.7429
10	Financial difficulties faced by owner	4	5		5	5	5	5	5	0.9714
11	Delays in interim payments	4	1		1	3	1	1	5	0.4571
31	Unexpected economic conditions	1	3		1	1	1	1	1	0.2571
37	Fraudulent practices and briberies	3	1		1	2	1	1	2	0.3143
41	Inappropriate financing	4	4		1	2	1	3	2	0.4857
49	under-estimation of project cost	1	1		1	3	1	1	2	0.2857
										0.5020
	Site									
15	Site acquisition problems	1	1		1	4	1	4	1	0.3714
16	Adverse weather conditions	1	1		1	2	1		1	0.2000
17	Unexpected location difficulty	1	1		1	1	1		1	0.1714
24	Shortage of site workers	2	4			1	1	1	1	0.2857
25	Lack of motivation to site workers	1	1		1	1	1	2	1	0.2286
27	Poor safety management on site	1	5		1	1	1	2	1	0.3429
36	Relationship between site workers and contractor	1	1		1	1	1	1	2	0.2286
50	Poor site management	1	4		1	1	1	1	1	0.2857
51	Site conditions	4			1	1	1	4	1	0.4000
58	Industrial action	1			1	2	1	1	2	0.2667
										0.2781
	Workmanship									
21	Incompentent contractors / subcontractors	1			1	1	1	2	2	0.2667
22	Incompentent consultants	2			1	2	1	2	2	0.3333
23	Unskilled / incompetent site workers	1	1		1	1	1	1	2	0.2286
28	Inexperienced client/owner	4	1		1	1	1	2	1	0.3143
60	Rework due to errors during construction	1	1		1	1	1	1	2	0.2286
										0.2743
	Community Involvement									
29	negative impact of project to society/env	3	3		1	1	1	2	1	0.3429

30	Lack of cooperation from local authorities	1	1		1	1	1	2	1	0.2286
33	Cultural crash among parties in project	4	5		1	4	1	1	2	0.5143
44	Lack of organisational support	5	1		1	3	1	1	2	0.4000
47	Not meeting end user expectation	1			1	4	1	1	1	0.3000
54	Lack of user input	2	5		1	1	1	4	1	0.4286
56	Low productivity of labour	2	1		1	2	1	1	2	0.2857
57	Vandalism of works - in progress or finished	1	1		1	2	1	1	2	0.2571
										0.3446

Table D- 8: Respondent Scores: Malembo Police

	Design	res 1	res 2	es 3	re s4	re s5	res 6	res 7	RII
1	Difficulty in design	2	2	2		2	2	2	0.4000
5	Ambiguities or mistakes in scope of work, specifications or drawings	4	4	4		2	4	4	0.7333
59	Conflicts between drawings and specifications	4	5	2		4	2	4	0.7000
62	Misinterpretation of drawings and specifications	1	4	1		1	1	4	0.4000
63	Improper construction methods	2	2	2		2	1	2	0.3667
									0.5200
	Project Planning								
2	Inappropriate risk allocation among project team members	1	2	2		1	5	2	0.4333
6	Inadequate project feasibility studies	2	1	2		2	5	1	0.4333
7	Lack of appropriate dispute resolution methods	2	4	2		5	4	3	0.6667
12	Inappropriate project planning and scheduling	2	1	1		5	4	2	0.5000
19	Involvement of large number of project participants	2	1	2		2	2	2	0.3667
32	Unfavourable government policy	2	4	2		2	2	4	0.5333
38	Unclear lines of responsibilities	2	5	2		1	2	1	0.4333
40	Inappropriate contract arrangement	2	1	1		1	1	1	0.2333
53	Undefined objectives and goals	2	1	2		2	1	1	0.3000
55	Unrealistic time frame and tasks	5	5	5		1	2	5	0.7667
									0.4667
	Procurement								
3	Inappropriate pricing/incetives of services rendered by contractors	3	1	2		4	5	3	0.6000
4	Difficulty tender process	2	3	1		1	3	2	0.4000
18	Problems related to variation orders	2	4	1		5	1	4	0.5667
20	Unavailability of materials and equipment	4	5	5		4	2	2	0.7333
									0.5750
	Contract Management								
8	Poor contract administration	3	5	2		5	2	4	0.7000
13	Project control problems	2	4	2		4	4	4	0.6667
14	Bureaucracy and Red tape within the project	5	5	5		1	5	5	0.8667
26	Poor relationship among project team members	2	2	2		1	2	2	0.3667
34	Litigation	1	2	1		2	1	1	0.2667
35	Poor quality control	2	1	2		1	3	1	0.3333
39	Communication and coordination problems	2	2	2		2	2	2	0.4000
42	Lack of management commitment	2	1	2		2	3	2	0.4000

43	Competing priorities	1	2	1		1	1	2	0.2667
45	Business politics	2	2	1		2	1	2	0.3333
46	Lack of prioritisation and project portfolio management	2	1	2		1	2	1	0.3000
48	Bad decisions	1	2	1		2	1	2	0.3000
52	Ignoring project warning signs	2	4	1		2	2	2	0.4333
61	Material management problem	2	2	2		2	2	2	0.4000
	Financial								
9	Financial difficulties faced by contractors	2	4	1		4	5	5	0.7000
10	Financial difficulties faced by owner	4	1	2		5	4	1	0.5667
11	Delays in interim payments	4	5	4		4	5	5	0.9000
31	Unexpected economic conditions	4	5	4		5	4	5	0.9000
37	Fraudulent practices and briberies	3	1	1		5	2	2	0.4667
41	Inappropriate financing	4	5	4		4	4	5	0.8667
49	under-estimation of project cost	2	4	2		1	5	4	0.6000
									0.5254
	Site								
15	Site acquisition problems	1	2	2		1	1	2	0.3000
16	Adverse weather conditions	1	1	2		2	1	1	0.2667
17	Unexpected location difficulty	2	2	2		1	1	2	0.3333
24	Shortage of site workers	2	2	1		2	2	1	0.3333
25	Lack of motivation to site workers	4	4	4		4	4	4	0.8000
27	Poor safety management on site	2	1	2		2	2	1	0.3333
36	Relationship between site workers and contractor	2	4	2		4	2	4	0.6000
50	Poor site management	2	1	1		2	1	1	0.2667
51	Site conditions	2	2	2		1	1	2	0.3333
58	Industrial action	4	5	2		5	5	5	0.8667
									0.4433
	Workmanship	`							
21	Incompentent contractors / subcontractors	1	1	2		1	1	5	0.3667
22	Incompentent consultants	1	2	2		2	1	2	0.3333
23	Unskilled / incompetent site workers	2	1	2		1	2	2	0.3333
28	Inexperienced client/owner	2	2	2		1	1	2	0.3333
60	Rework due to errors during construction	5	4	4		1	1	1	0.5333
									0.3800
	Community Involvement								
29	negative impact of project to society/environment	2	1	1		2	1	2	0.3000
30	Lack of cooperation from local authorities	2	2	2		1	1	1	0.3000
33	Cultural crash among parties in project	2	1	2		1	1	2	0.3000
44	Lack of organisational support	4	4	2		5	4	4	0.7667

47	Not meeting end user expectation	2	5	2		4	4	5	0.7333
54	Lack of user input	1	5	1		5	1	5	0.6000
56	Low productivity of labour	2	2	2		5	1	2	0.4667
57	Vandalism of works - in progress or finished	2	4	1		4	4	4	0.6333
									0.5125

Table D- 9: Respondent Scores: Nathenje Health

	Design	**res 1**	**res 2**	**es 3**	**re s4**	**re s5**	**res 6**	**res 7**	**res 8**	**RII**
1	Difficulty in design	5	5	5	5	5	3	5	5	0.950
5	Ambiguities or mistakes in scope of work, specifications or drawings	3	4	3	2	3		3	5	0.657
59	Conflicts between drawings and specifications	1	2	5	3	1	2	1	1	0.400
62	Misinterpretation of drawings and specifications	5	4	1	5	1	3	1	5	0.625
63	Improper construction methods	1	2	5	5	5	5	5	5	0.825
										0.691
	Project Planning									
2	Inappropriate risk allocation among project team members	2	4	5	5	5	3	5	5	0.850
6	Inadequate project feasibility studies	5	4	4	1			4	4	0.733
7	Lack of appropriate dispute resolution methods	4		5	5	3	5	4	5	0.886
12	Inappropriate project planning and scheduling	3	4	5	5	3	1	3	5	0.725
19	Involvement of large number of project participants	5	3	1	5	1	1	1	5	0.550
32	Unfavourable government policy	1	4	1	5	3	5	5	5	0.725
38	Unclear lines of responsibilities	3	3	5	5	3	2	3	1	0.625
40	Inappropriate contract arrangement	5	4	3	5	5	5	5	5	0.925
53	Undefined objectives and goals	1	1	5	5	1	3	1	1	0.450
55	Unrealistic time frame and tasks	2	2	5	3	5		1	1	0.543
										0.701
	Procurement									
3	Inappropriate pricing/incetives of services rendered by contractors	3	2	1	5	1	5	1	2	0.500
4	Difficulty tender process		5	5	5			5	5	1.000
18	Problems related to variation orders	5	2	1	5	1	5	1	1	0.525
20	Unavailability of materials and equipment	1	2	1	2	1	1	1	5	0.350
										0.594
8	Poor contract administration	5	4		5	5	5	5	5	0.971
13	Project control problems	5	5	5	5	5	5	5	5	1.000
14	Bureaucracy and Red tape within the project	5	4	1	5	5	5	5	5	0.875
26	Poor relationship among project team members	2	2	5	3	5	3	3	5	0.700
34	Litigation	1	1	5		1		1	1	0.250
35	Poor quality control	5	4	5	5	5	5	5	5	0.975
39	Communication and coordination problems	1	4	5	5	5	5	5	5	0.875

42	Lack of management commitment	1	1	5	5	1	1	1	1	0.400
43	Competing priorities	5	1	1	5		5		4	0.700
45	Business politics	1	1	5	5	1	2	1	1	0.425
46	Lack of prioritisation and project portfolio management	4	4	5	3	4	5	5	4	0.850
48	Bad decisions	5	5	3	2	5	5	5	5	0.875
52	Ignoring project warning signs	5	5	5	5	5	5	5	5	1.000
61	Material management problem	5	4	1	3	1	2	1	1	0.450
										0.739
	Financial									
9	Financial difficulties faced by contractors	5	1	1	2		3		2	0.467
10	Financial difficulties faced by owner	4	1	3	2		1	5	4	0.571
11	Delays in interim payments	5	1	3	2	3	1	3	3	0.525
31	Unexpected economic conditions	3	2	1	3	1	2	1	1	0.350
37	Fraudulent practices and briberies	5	5	3	5	5	5	5	5	0.950
41	Inappropriate financing	5	2	5	3	3	1	3	5	0.675
49	under-estimation of project cost	3	3	5	3	3	1	3	3	0.600
										0.591
	Site									
15	Site acquisition problems	1	1	1	2	1	1	1	1	0.225
16	Adverse weather conditions	1	1	1	2	1	1	1	4	0.300
17	Unexpected location difficulty	1	2	1	5	1	1	1	1	0.325
24	Shortage of site workers	4	4	1	5	1		1	4	0.571
25	Lack of motivation to site workers	3	3	3	3	3	5	3	5	0.800
27	Poor safety management on site		5	5	3	5	5	5	5	0.943
36	Relationship between site workers and contractor	1	4	5	4	5	5	5	1	0.750
50	Poor site management	1	1	5	2	1	2	1	1	0.350
51	Site conditions	1	2	5	2	1	2	1	1	0.375
58	Industrial action	1	2	5	3	1	3	1	1	0.425
										0.506
	Workmanship									
21	Incompentent contractors / subcontractors	4	4	5	2	1	5	5	5	0.775
22	Incompentent consultants	5	5	5	2	5	5	5	5	0.925
23	Unskilled / incompetent site workers	5	5	5	5	5	5	5	5	1.000
28	Inexperienced client/owner	5	3	5	1	5	5	5	5	0.850
60	Rework due to errors during construction	1	2	5	5	1	2	1	5	0.550
										0.820
	Community Involvement									
29	negative impact of project to society/environment	1	2	5	3		3	5	1	0.500
30	Lack of cooperation from local authorities	5	1	1	3	1	5	1	1	0.450
33	Cultural crash among parties in project	1	2	1	3	1	1	1	1	0.275
44	Lack of organisational support	1	1	1	1		1	1	1	0.200

47	Not meeting end user expectation	4	4	5	5	4	5	1	5	0.825
54	Lack of user input	5	5	5	5	1	5	5	5	0.900
56	Low productivity of labour	1	1	5	5	5		5	2	0.686
57	Vandalism of works - in progress or finished	4	4	5	3	5	3	5	5	0.850
										0.586

Table D- 10: Respondent Scores: Chiwamba Police

	Design	**res 1**	**res 2**	**es3**	**RII**
1	Difficulty in design	2	3	2	0.467
5	Ambiguities or mistakes in scope of work, specifications or drawings	2	2	2	0.400
59	Conflicts between drawings and specifications	2	3	2	0.467
62	Misinterpretation of drawings and specifications	2	2	2	0.400
63	Improper construction methods	2	3	4	0.600
					0.467
	Project Planning				
2	Inappropriate risk allocation among project team members	2	4	2	0.533
6	Inadequate project feasibility studies	2	4	2	0.533
7	Lack of appropriate dispute resolution methods	2	4	2	0.533
12	Inappropriate project planning and scheduling	2	3	2	0.467
19	Involvement of large number of project participants	4	4	1	0.600
32	Unfavourable government policy	1	2	2	0.333
38	Unclear lines of responsibilities	2	1	2	0.333
40	Inappropriate contract arrangement	2	3	2	0.467
53	Undefined objectives and goals	2	3	2	0.467
55	Unrealistic time frame and tasks	4	1	2	0.467
					0.473
	Procurement				
3	Inappropriate pricing/incetives of services rendered by contractors	4	4	4	0.800
4	Difficulty tender process	2	5	2	0.600
18	Problems related to variation orders	4	4	2	0.667
20	Unavailability of materials and equipment	5	2	4	0.733
					0.700
8	Poor contract administration	2	5	2	0.600
13	Project control problems	4	2	2	0.533
14	Bureaucracy and Red tape within the project	4	5	2	0.733
26	Poor relationship among project team members	2	3	4	0.600
34	Litigation	2	4	2	0.533
35	Poor quality control	1	1	2	0.267
39	Communication and coordination problems	2	2	2	0.400
42	Lack of management commitment	1	3	3	0.467
43	Competing priorities	2	4	2	0.533
45	Business politics	2	1	2	0.333
46	Lack of prioritisation and project portfolio management	2	2	4	0.533
48	Bad decisions	2	1	2	0.333
52	Ignoring project warning signs	2	3	2	0.467
61	Material management problem	2	3	2	0.467

					0.486
	Financial				
9	Financial difficulties faced by contractors	4	5	4	0.867
10	Financial difficulties faced by owner	4	1	4	0.600
11	Delays in interim payments	4	5	4	0.867
31	Unexpected economic conditions	4	5	4	0.867
37	Fraudulent practices and briberies	2	4	4	0.667
41	Inappropriate financing	4	4	4	0.800
49	under-estimation of project cost	4	1	4	0.600
					0.752
	Site				
15	Site acquisition problems	1	2	1	0.267
16	Adverse weather conditions	2	5	2	0.600
17	Unexpected location difficulty	4	1	2	0.467
24	Shortage of site workers	2	2	2	0.400
25	Lack of motivation to site workers	2	4	4	0.667
27	Poor safety management on site	2	3	2	0.467
36	Relationship between site workers and contractor	2	3	4	0.600
50	Poor site management	2	4	2	0.533
51	Site conditions	2	5	2	0.600
58	Industrial action	2	3	4	0.600
					0.520
	Workmanship				
21	Incompentent contractors / subcontractors	2	2	2	0.400
22	Incompentent consultants	2	2	2	0.400
23	Unskilled / incompetent site workers	1	4	2	0.467
28	Inexperienced client/owner	2	5	2	0.600
60	Rework due to errors during construction	2	4	4	0.667
					0.507
	Community Involvement				
29	negative impact of project to society/environment	2	1	2	0.333
30	Lack of cooperation from local authorities	2	3	2	0.467
33	Cultural crash among parties in project	2	4	2	0.533
44	Lack of organisational support	2	5	4	0.733
47	Not meeting end user expectation	4	5	4	0.867
54	Lack of user input	2	2	4	0.533
56	Low productivity of labour	4	4	2	0.667
57	Vandalism of works - in progress or finished	2	3	2	0.467
					0.575

Table D- 11: Respondent Scores: Kalumbu Health

	Design	**res 1**	**res 2**	**es 3**	**res4**	**res5**	**res 6**	**res 7**	**res 8**	**RII**
1	Difficulty in design	1	4	1	1	1	4	1	4	0.425
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	4	1	3	1	4	1	5	0.500
59	Conflicts between drawings and specifications	1	3	1	3	1	4	5	5	0.575
62	Misinterpretation of drawings and specifications	1	3	1	4	1	3	1	1	0.375
63	Improper construction methods	1	3	1	4	1	3	1	5	0.475
										0.470
	Project Planning									
2	Inappropriate risk allocation among project team members	2	3	2	4	1	3	1	5	0.525
6	Inadequate project feasibility studies	1	4	1	1	1	4	1	1	0.350
7	Lack of appropriate dispute resolution methods	1	3	1	1	1	3	2	4	0.400
12	Inappropriate project planning and scheduling	1	3	1	1	1	4	1	1	0.325
19	Involvement of large number of project participants	1	3	1	1	1	1	1	1	0.250
32	Unfavourable government policy	5	3	5	4	1	3	4		0.625
38	Unclear lines of responsibilities	1	2	1	1	1	1	3	5	0.375
40	Inappropriate contract arrangement	1	4	1	1	1	5	1	5	0.475
53	Undefined objectives and goals	1	3	1	1	1	3	1	5	0.400
55	Unrealistic time frame and tasks	1	4	1	4	1	5	1	1	0.450
										0.418
	Procurement									
3	Inappropriate pricing/incetives of services rendered by contractors	3	3	1	1	1	3	2	5	0.475
4	Difficulty tender process	1	3	1	1	1	3	3	4	0.425
18	Problems related to variation orders	1	3	1	1	1	3	1	2	0.325
20	Unavailability of materials and equipment	1	3	1	1	1	1	1	3	0.300
										0.381
	Contract Management									
8	Poor contract administration	1	4	1	1	1	4	1	5	0.450
13	Project control problems	1	3	1	1	1	3	1	1	0.300
14	Bureaucracy and Red tape within the project	1	3	1	1	1	3	1	1	0.300
26	Poor relationship among project team members	1	4	1	1	1	5	1	5	0.475
34	Litigation	1	2	1	1	1	1	1	3	0.275
35	Poor quality control	1	1	1	4	1	1	1	1	0.275
39	Communication and coordination problems	1	4	1	4	1	4	1	4	0.500

42	Lack of management commitment	1	3	1	4	1	3	1	5	0.475
43	Competing priorities	1	5	1	1	1	3	1	5	0.450
45	Business politics	1	3	1	3	1	3	1	4	0.425
46	Lack of prioritisation and project portfolio management	1	4	1	4	1	4	1	3	0.475
48	Bad decisions	1	2	1	5	1	3	1	5	0.475
52	Ignoring project warning signs	1	4	1	4	1	3	1	1	0.400
61	Material management problem	1	3	1	4	1	3	1	5	0.475
										0.411
	Financial									
9	Financial difficulties faced by contractors	1	3	1	4	1	3	1	1	0.375
10	Financial difficulties faced by owner	1	3	1	4	1	3	1	3	0.425
11	Delays in interim payments	1	3	1	1	1	3	3	4	0.425
31	Unexpected economic conditions	1	3	1	4	1	1	4	1	0.400
37	Fraudulent practices and briberies	1	3	1	1	1	5	1		0.325
41	Inappropriate financing	1	1	1	1	1	1	1	5	0.300
49	under-estimation of project cost	1	3	1	4	1	3	1	5	0.475
										0.389
	Site									
15	Site acquisition problems	1	3	1	1	1	4	3	3	0.425
16	Adverse weather conditions	1	3	1	1	1	1	4	1	0.325
17	Unexpected location difficulty	1	3	1	3	1	4	1	3	0.425
24	Shortage of site workers	1	1	1	1	1	1	1	1	0.200
25	Lack of motivation to site workers	1	1	1	1	1	1	4	3	0.325
27	Poor safety management on site	1	3	1	1	1	4	1	1	0.325
36	Relationship between site workers and contractor	1	2	1	1	1	1	1	3	0.275
50	Poor site management	1	4	1	1	1	5	1	5	0.475
51	Site conditions	1	2	1	1	1	5	1	1	0.325
58	Industrial action	1	3	1	1	1	1	1	5	0.350
										0.345
	Workmanship									
21	Incompentent contractors / subcontractors	1	4	1	4	1	4	1		0.400
22	Incompentent consultants	1	4	1	4	1	4	1	1	0.425
23	Unskilled / incompetent site workers	1	4	1	1	1	1	1	5	0.375
28	Inexperienced client/owner	1	4	1	4	1	4	3	1	0.475
60	Rework due to errors during construction	1	2	1	1	1	3	4	4	0.425
										0.420
	Community Involvement									
29	negative impact of project to society/environment	1	1	1	1	1	1	1	3	0.250
30	Lack of cooperation from local authorities	1		1	1	1	3	4	2	0.325
33	Cultural crash among parties in project	1	3	1	1	1	4	1	4	0.400
44	Lack of organisational support	1	3	1	4	1	1	1	1	0.325

47	Not meeting end user expectation	1	3	1	5	1	3	1	1	0.400
54	Lack of user input	1	3	1	1	1	5	1	4	0.425
56	Low productivity of labour	1	3	1	4	1	3	3	4	0.500
57	Vandalism of works - in progress or finished	5	3	5	5	1	5	1	5	0.750
										0.422

Table D- 12: Respondent Scores: Chilobwe Health

	Design	res 1	res 2	es 3	re s4	re s5	res 6	res 7	res 8	RII
1	Difficulty in design	1	1	1	1	1	3	1		0.225
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1	2	1	1	3	1		0.250
59	Conflicts between drawings and specifications	1	1	1	1	1	2	1		0.200
62	Misinterpretation of drawings and specifications	2	1	1	1	1	2	1		0.225
63	Improper construction methods	1	1	1	1	1	2	1		0.200
										0.220
	Project Planning									
2	Inappropriate risk allocation among project team members	1	1	1	1	1	2	1		0.200
6	Inadequate project feasibility studies	1	1	1	1	1	3	1		0.225
7	Lack of appropriate dispute resolution methods	2	1	2	2	1	3	1		0.300
12	Inappropriate project planning and scheduling	1	4	1	1	1	4	1		0.325
19	Involvement of large number of project participants	1	2	2	1	1	2	1		0.250
32	Unfavourable government policy	2	1	2	2	1	2	1		0.275
38	Unclear lines of responsibilities	2	1	2	1	1	4	1		0.300
40	Inappropriate contract arrangement	1	1		1	1	4	1		0.225
53	Undefined objectives and goals	1	1	1	1	1	4	1		0.250
55	Unrealistic time frame and tasks	2	1	2	1	1	2	1		0.250
										0.260
	Procurement									
3	Inappropriate pricing/incetives of services rendered by contractors	1	1	2	2	1	2	2		0.275
4	Difficulty tender process	1	1	1	1	2	4	1		0.275
18	Problems related to variation orders	1	2	1	1	1	2	1		0.225
20	Unavailability of materials and equipment	1	5	1	1	1	2	4		0.375
										0.288
	Contract Management									
8	Poor contract administration	1	1	1	1	1	4	1		0.250
13	Project control problems	2	4	2	2	1	2	1		0.350
14	Bureaucracy and Red tape within the project	5	1	1	4	1	2	2		0.400
26	Poor relationship among project team members	1	1	2	2	1	2	1		0.250
34	Litigation	2	1	2	2	1	1	1		0.250
35	Poor quality control	1	2	1	1	1	4	1		0.275
39	Communication and coordination problems	1	1	1	1	1	4	4		0.325

42	Lack of management commitment	2	2	2	2	1	4	2		0.375
43	Competing priorities	1	1	1	1	1	4	1		0.250
45	Business politics	2	1	2	2	1	4	1		0.325
46	Lack of prioritisation and project portfolio management	1	2	1	2	1	2	4		0.325
48	Bad decisions	2	1	1	1	1	1	1		0.200
52	Ignoring project warning signs	1	1	1	1	1	2	1		0.200
61	Material management problem	1	2	2	2	2	2	1		0.300
										0.291
	Financial									
9	Financial difficulties faced by contractors	2	4	2	2	1	2	1		0.350
10	Financial difficulties faced by owner	2		1	2	1	2	4		0.300
11	Delays in interim payments	1	4	2	2	1	4	1		0.375
31	Unexpected economic conditions	3	1	1	3	1	2	3		0.350
37	Fraudulent practices and briberies	1	1	1	1	1	4	1		0.250
41	Inappropriate financing	2	4	2	1	1	4	1		0.375
49	under-estimation of project cost	4	1	2	2	1	2	1		0.325
										0.332
	Site									
15	Site acquisition problems	2	2	2	1	1	2	1		0.275
16	Adverse weather conditions	1	2	2	1	1	2	1		0.250
17	Unexpected location difficulty	1	1	1	1	1	2	1		0.200
24	Shortage of site workers	1	1	2	2	1	2	1		0.250
25	Lack of motivation to site workers	2	1	1	1	1	2	1		0.225
27	Poor safety management on site	1	2	1	1	1	2	1		0.225
36	Relationship between site workers and contractor	1	1	1	1	1	4	1		0.250
50	Poor site management	1	1	1	1	1	2	1		0.200
51	Site conditions	1	1	1	1	1	2	1		0.200
58	Industrial action	4	1	2	2	1	2	1		0.325
										0.240
	Workmanship									
21	Incompentent contractors / subcontractors	1	4	1	1	1	4	1		0.325
22	Incompentent consultants	2	1	2	2	1	4	1		0.325
23	Unskilled / incompetent site workers	2	1	1	1	1	3	1		0.250
28	Inexperienced client/owner	1	1	1	1	1	2	1		0.200
60	Rework due to errors during construction	2	1	2	1	1	2	1		0.250
										0.270
	Community Involvement									
29	negative impact of project to society/environment	2	1	1	1	1	2	1		0.225
30	Lack of cooperation from local authorities	1	1	2	2	1	2	2		0.275
33	Cultural crash among parties in project	1	1	1	1	1	2	1		0.200
44	Lack of organisational support	1	1	1	4	1	4	2		0.350

47	Not meeting end user expectation	1	1	1	2	1	2	4		0.300
54	Lack of user input	2	2	2	2	2	4	1		0.375
56	Low productivity of labour	1	1	1	1	1	2	1		0.200
57	Vandalism of works - in progress or finished	1	1	1	1	1	2	1		0.200
										0.266

Table D- 13: Respondent Scores: Nguluwe Health

	Design	res 1	res 2	es 3	res 4	res 5	res 6	RII
1	Difficulty in design	1	1	1	1	1	1	0.150
5	Ambiguities or mistakes in scope of work, specifications or drawings	1	1	1	1	1	1	0.150
59	Conflicts between drawings and specifications	1	1	1	1	1	1	0.150
62	Misinterpretation of drawings and specifications	1	1	1	1	1	1	0.150
63	Improper construction methods	1	1	1	1	1	1	0.150
								0.150
	Project Planning							
2	Inappropriate risk allocation among project team members	1	1	1	1	1	1	0.150
6	Inadequate project feasibility studies	5	5	5	5	5	5	0.750
7	Lack of appropriate dispute resolution methods	1	1	1	1	1	1	0.150
12	Inappropriate project planning and scheduling	1	1	1	1	1	1	0.150
19	Involvement of large number of project participants	1	1	1	1	1	1	0.150
32	Unfavourable government policy	5	5	5	5	5	5	0.750
38	Unclear lines of responsibilities	4	4	4	4	4	4	0.600
40	Inappropriate contract arrangement	1	1	1	1	1	1	0.150
53	Undefined objectives and goals	1	1	1	1	1	1	0.150
55	Unrealistic time frame and tasks	1	1	1	1	1	1	0.150
								0.315
	Procurement							
3	Inappropriate pricing/incetives of services rendered by contractors	1	1	1	1	1	1	0.150
4	Difficulty tender process	1	1	1	1	1	1	0.150
18	Problems related to variation orders	1	1	1	1	1	1	0.150
20	Unavailability of materials and equipment	5	5	5	5	5	5	0.750
								0.300
	Contract Management							
8	Poor contract administration	1	1	1	1	1	1	0.150
13	Project control problems	1	1	1	1	1	1	0.150
14	Bureaucracy and Red tape within the project	5	5	5	5	5	5	0.750
26	Poor relationship among project team members	1	1	1	1	1	1	0.150
34	Litigation	1	1	1	1	1	1	0.150
35	Poor quality control	1	1	1	1	1	1	0.150
39	Communication and coordination problems	4	5	2	3	1	1	0.400
42	Lack of management commitment	5	5	5	5	5	5	0.750
43	Competing priorities	1	1	1	1	1	1	0.150
45	Business politics	5	5	5	5	5	5	0.750
46	Lack of prioritisation and project portfolio mgt	5	5	5	5	5	5	0.750
48	Bad decisions	5	5	5	1	1	1	0.450

52	Ignoring project warning signs	2	2	2	2	2	2	0.300
61	Material management problem	5	5	5	5	5	5	0.750
								0.414
	Financial							
9	Financial difficulties faced by contractors	1	1	1	1	1	1	0.150
10	Financial difficulties faced by owner	1	1	1	1	1	1	0.150
11	Delays in interim payments	1	1	1	1	1	1	0.150
31	Unexpected economic conditions	1	1	1	1	1	1	0.150
37	Fraudulent practices and briberies	5	5	5	5	5	5	0.750
41	Inappropriate financing	1	1	1	1	1	1	0.150
49	under-estimation of project cost	1	1	1	1	1	1	0.150
								0.236
	Site							
15	Site acquisition problems	1	1	1	1	1	1	0.150
16	Adverse weather conditions	1	1	1	1	1	1	0.150
17	Unexpected location difficulty	1	1	1	1	1	1	0.150
24	Shortage of site workers	1	1	1	1	1	1	0.150
25	Lack of motivation to site workers	1	1	1	1	1	1	0.150
27	Poor safety management on site	1	1	1	1	1	1	0.150
36	Relationship between site workers and contractor	1	1	1	1	1	1	0.150
50	Poor site management	1	1	1	1	1	1	0.150
51	Site conditions	1	1	1	1	1	1	0.150
58	Industrial action	1	1	1	1	1	1	0.150
								0.150
	Workmanship							
21	Incompentent contractors / subcontractors	1	1	1	1	1	1	0.150
22	Incompentent consultants	1	1	1	1	1	1	0.150
23	Unskilled / incompetent site workers	1	1	1	1	1	1	0.150
28	Inexperienced client/owner	1	1	1	1	1	1	0.150
60	Rework due to errors during construction	1	1	1	1	1	1	0.150
								0.150
	Community Involvement							
29	negative impact of project to society/environment	1	1	1	1	1	1	0.150
30	Lack of cooperation from local authorities	1	1	1	1	1	1	0.150
33	Cultural crash among parties in project	1	1	1	1	1	1	0.150
44	Lack of organisational support	4	4	4	4	4	4	0.600
47	Not meeting end user expectation	5	5	5	5	5	5	0.750
54	Lack of user input	1	1	1	1	1	1	0.150
56	Low productivity of labour	1	1	1	1	1	1	0.150
57	Vandalism of works - in progress or finished	2	2	2	2	2	2	0.300
								0.300

Appendix E: LIST OF RESPONDENTS

NO.	**NAME**	**ADDRESS**	**CONTACT NO.**
1	DOROTHY J. MKWANJE	NATHENJE HEALTH CENTRE, BOX 44, NATHENJE	0998 137 511
2	MAI D. BINOSI	NATHENJE HEALTH CENTRE, BOX 10, NATHENJE	0995 736 550
3	V.H LUNDA (VICE CHAIRMAN	SONKHWE F.P SCHOOL, BOX 39, LL	0993 320 318
4	G.V.H MONGO	BOX 40, NATHENJE	0992 512 245
5	JAMES SEGULA	LL DHO, BOX 1274, LL	0995454314/0888506630
6	G.V.H NATHENJE	NATHENJE HEALTH CENTRE, BOX 24	0991 977 899
7	G.V.H KACHOLA	KACHOLA Vge. C/O BOX 165, NATHENJE	0999 798 538
8	KAWISA JICKTON	NATHENJE HEALTH CENTRE, BOX 44	09997 392 951
9	JOSEPH MAKUNGULA	BOX 18, MAJIGA, KASIYA	0992 068 044
10	ALFRED KHOFIMANI	BOX 28, KASIYA	0993 419 234
11	E. MANDAACHEPA	BOX 1, NSARU	0999 474 983
12	ROLENT IZEKI	BOX 18, MAJIGA, KASIYA	-
13	SAIDI ANDISON	BVIZIMBA, BOX 18, KASIYA	0995 310 453
14	HENERIETA CHIBWAZI	CHIKUNKHULIRA Vge, BOX 18, MAJIGA, KASIYA	-
15	Snr G.V.H KHONGONI	BOX 18, KASIYA	0995 310 592
16	ZIYENDAM`MANJA BANDA	BOX 6 MPINGU, LL	0999 725 888
17	SAID THAUZENI	BOX 6, MPINGU, LL	0992 980 710

18	H.J.K KADZAMIRA	BOX 40270, LL 4	0999 037 876
19	S.C MADZOMBWE	-	0991 875 048
20	INS C.L MTAMBALIKA	MPINGU POLICE UNIT, BOX 627, LL	0999 110 789
21	LINGSON B. CHILONGA	BOX 49, NSARU, LL	0992 059 534
22	DIVARSONI KACHIGAMBA	BOX 10, NSARU	-
23	G.V.H CHINYAMA	B0X 49, NSARU, LL	0999 735 619
24	THUBWA PHIRI/LAMBULANI	BOX 49, NSARU,LL	-
25	NUMERIE MKOLOWEKO	BOX 49, NSARU,LL	0999 097 327
26	KACHISON KASELERA	BOX 49, NSARU, LL	-
30	MAKIDAFU BETEMAN	BOX 49, NSARU	-
31	F.M MNJUZI	BOX 49, NSARU,LL	0999 523 746
32	L.J KALONGA	KAMAMINA LOCAL NGO, BOX 74, LUMBADZI	0999 446 057
33	JAPHET S. CHIMPENI	BOX 40057, KANENGO, LL 4	0999 495 535/0882 949 691
34	MR BAKALI CHISALE	NALIKULE CONSTRUCTION	0999 473 528
35	WILIJOHN HELISON	NGULUWE F.P SCHOOL, BOX 88, LL	0997 691 951
36	LUBEYA KASONKANJI	BOX 88, LIKUNI	-
37	CHAKANIKA MALIZANI	NGULUWE F.P SCHOOL, BOX 88, LIKUNI	-
38	KAMWENDO JOLODANI	BOX 88, LIKUNI	-

39	MAZONI B. MAIKALANGA	BOX 88, LIKUNI	0991 427 763
40	G.V.H NGULUWE NTOWO	BOX 88, LIKUNI, LL	0991 771 251
41	LUCY KALIPENI	LIKUNI	0999 285 812
42	CHITONDE DAMANLANJI	BOX 54, CHIUNGO, LL	0998 618 711
43	G.V.H MABUTAO	BOX 13, CHIUNGO	0998 253 870/0888 714 356
44	SITAFIYELE SAGWIRA	BOX 2, CHIWUNGO	-
45	CLEMENT L. MALATA	BOX 38, CHIUNGO, LL	0994 341 498
46	SUPT PAHUWA	O/C KASIYA	0999 287 485/0888 512 712
47	LIMISON TAVEN	P/A CHIUNGO,LL	0993 375 239
48	INNOCENT S.C MASULA	BOX 13, CHIUNGO, LL	0888 191 640
49	GRACE KALEMA	BOX 17, MITUNDU, LL	0997 719 659
50	SUB INSP S. CHIKHUNGWA	BOX 50, NATHENJE	0992 451 126
51	ALFRED MASTER	CHADABWA F.P SCHOOL, P.O BOX 17, MITUNDU	-
52	V.H MSAMBALUME	MSAMBALUME Vge. C/O BOX 38, MITUNDU	0882 538 595
53	CHIMTEDZA KAWANGA	MAPEMBE POLICE UNIT, UNIT 34	-
54	LUCIANO BLACK CHEMBE	BOX 38, MITUNDU	0991 491 794
55	FENELESI MALITENI	MGUNDAMAVU Vge, BOX 17, MITUNDU	0992 237 558
56	BLESSING A. LEMIAS	MZUMIRA Vge. P.O BOX 17	-

57	PETER CHISAPO	BOX 198, NSARU, LL	0995 401 246/0888 622 160
58	MRS LILIAN KAMWAMBA	BOX 21, NSARU, LL	0993 458 190
59	EFLEM CHIMPHEPO	BOX 16, NSARU,LL	0993 162 387
60	EDSON DIVAISON MALITENI	BOX 173, NSARU, LL	0999 344 503
61	ZIKIELY JEREMIA SONKHO	BOX 51,NSARU,LL	0999 414 693
62	LEDSON J. MALIKEBU	MAKAMBWE Vge, BOX 145, NSARU, LL	0999 246 510
63	NICHOLAS KAFWAFWA	BOX 112, NSARU, LL	0999 685 177
64	NYAMBI NANDOLI	BOX 20, NSARU, LL	0993 980427
65	SAM KABETA	NKHOMA HOSPITAL	0999 409 560
66	JAMES FINIAS	BOX 34, MBUNA, LL	-
67	CATREEN KUCHISANJA	NKHOMA HOSPITAL, BOX 48	-
68	MRS KASHON	GWANDA Vge, BOX 48, NKHOMA	-
69	V.H MADETSA CHIPESO	NKHOMA HOSPITAL, BOX 4	0999 378 375
70	AMOSI NJIWA	KALAMBA SCHOOL	-
71	MRS J. LEKODI	V.H NGULUWE,NKHIOMA	-
72	GLYN YOHANE	BOX 48, LL	0999 442 975
73	DICKSON KACHIGUNDA	BOX 48, NKHOMA	0996 434 899
74			
75	PITILIZANI GOLIYATI	-	0992 115 972

76	AUSTEN CHOFUNA	FROM G.V.H SAPAWO	-
77	MOFFAT CHILAMBA	BOX 43, NKHOMA	0888 652 611/0995 525 454
78	PETER STON KALUMBU	BOX 16, NKHOMA	0996 314 440/0996 571 052
79	SAMUEL E. FREZER	BOX 74	0999 366 291
80	JAMES GAMA	CHITEKWERE	-
81	KENNEDY N.R CHITEDZE	BOX 74, NKHOMA	0998 350 740
82	G.V.H CHIMONO	BOX 20053, KAWALE	0991 162 440
83	LONASI M. MUHONE	KANG`OMA	0884 595 143
84	SILIRANI CHIPULA	BOX 49, LL	-
85	FREDRIC MGENJE	BOX 49, LL	0998 833 243
86	INNICENT SUWITI	C/O KANG`OMA HEALTH CENTRE, BOX 1274	0991 718 037
87	GEORGE KANDIUZE	MDONDWE Vge	0995 352 578
88	PETER BANDA	BOX 313, LL	0999 393 741
89	G.V.H CHALULA	TSABANGO	0999 802 835
90	V.H MKONKHERA MAGALASI	BOX 84, NATHENJE	-
91	LIMBIKANI MPOKOSA	MINISTRY OF HEALTH	0999 470 332
92	NEPIYALA SIMIYONI	KALUMBU PRIMARY SCHOOL, BOX 96, LL	-
93	DOMOLIASI CHIMZIMU	KALUMBU SCHOOL	0994 523 308
94	I SANDRAM	MINISTRY OF HEALTH	0999 046 172
95	KONDWANI DATHI	BOX 84, NATHENJE	0991 549 343
96	MALANGO KAWAZA	KALUMBU F.P SCHOOL,	0996 783 864

		BOX 84, LL	
97	BAITONI SITIMA	V.H NYONGANI, T/A KALUMBU	0994 304 728
98	JAMES Y.L CHIKAFA	C/O MSUNDWE POLICE UNIT	0999 932 332
99	Snr. G.V.H CHINKHUNDA	BOX 15, MAWELO, LL	-
100	D/ CONST CHILALA NKHOMA	MSUNDWE POLICE UNIT , BOX 38, NAMITETE	0999 021 738
101	OSCAR NJANJI	MSUNDWE POLICE UNIT, BOX 404, NAMITETE	0884 888 803
102	P. MNKHUNTHA	MSUNDWE TRADING CENTRE	-
103	T. CHIPUNGU	MSUNDWE POLICE COMMITTEE	-
104	DICKSON G. MTALIMANJA	BOX 15, MAWELO, LL	0998 026 559
105	AUSTEN CHIDAWATI	BOX 93, LL	0999 615 580
106	EMMA NKHOMA	BOX 93, LL	0999 061 346
107	MABVUTO THOMAS	LILONGWE DHO OFFICE	0999 932 492
108	FRANK MAFENI		0999 894 172

Appendix F: Spearman's Correlation Coefficients

Table F- 1: Design and Project Planning

Project	Sample	Design	Rank	Project Planning	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.315	11	3	9
Mapembe	6	0.2	13	0.26	13.5	-0.5	0.25
Nkhoma	13	0.2	12	0.305	12	0	0
Chilobwe	11	0.22	11	0.26	13.5	-2.5	6.25
Ukwe	1	0.255	10	0.431	8	2	4
Nsundwe	7	0.28	9	0.3343	10	-1	1
Chitekwere	5	0.3543	8	0.4886	4	4	16
Nsaru	2	0.405	7	0.6375	2	5	25
Mpingu	3	0.44	6	0.44	7	-1	1
Chiwamba	14	0.4667	5	0.4733	5	0	0
Kalumbu	12	0.47	4	0.4175	9	-5	25
Kang'oma	4	0.4889	3	0.5447	3	0	0
Malembo	8	0.52	2	0.4667	6	-4	16
Nathenje	9	0.6914	1	0.7012	1	0	0
						Σd^2	103.5
						n	14
						n^3	2744
		r = 0.7725				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 2: Design and Contract Management

Project	Sample	Design	Rank	Contract Management	Rank	*d*	*d*d*
Ukwe	1	0.255	14	0.3858	10	4	16
Ngulube	10	0.15	13	0.4154	7	6	36
Mapembe	6	0.2	12	0.2857	14	-2	4
Nkhoma	13	0.2	11	0.3643	11	0	0
Chilobwe	11	0.22	10	0.2911	13	-3	9
Nsundwe	7	0.28	9	0.3027	12	-3	9
Chitekwere	5	0.3543	8	0.4082	9	-1	1
Nsaru	2	0.405	7	0.6964	2	5	25
Mpingu	3	0.44	6	0.4286	5	1	1
Chiwamba	14	0.4667	5	0.4857	3	2	4
Kalumbu	12	0.47	4	0.4107	8	-4	16
Kang'oma	4	0.4889	3	0.4444	4	-1	1
Malembo	8	0.52	2	0.431	6	-4	16
Nathenje	9	0.6914	1	0.739	1	0	0
						Σd^2	138
		r = 0.69				n	14
						n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 3: Design and Procurement

Project	Sample	Design	Rank	Procurement	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.3	11	3	9
Mapembe	6	0.2	13	0.2	13.5	-0.5	0.25
Nkhoma	13	0.2	12	0.2	13.5	-1.5	2.25
Chilobwe	11	0.22	11	0.2875	12	-1	1
Ukwe	1	0.255	10	0.5354	8	2	4
Nsundwe	7	0.28	9	0.3619	10	-1	1
Chitekwere	5	0.3543	8	0.5571	6	2	4
Nsaru	2	0.405	7	0.85	1	6	36
Mpingu	3	0.44	6	0.6	3	3	9
Chiwamba	14	0.4667	5	0.7	2	3	9
Kalumbu	12	0.47	4	0.3813	9	-5	25
Kang'oma	4	0.4889	3	0.5556	7	-4	16
Malembo	8	0.52	2	0.575	5	-3	9
Nathenje	9	0.6914	1	0.5938	4	-3	9
						Σd^2	134.5
						n	14
						n^3	2744
		r=0.7044				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 4: Design and Site

Project	Sample	Design	Rank	Site	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.15	14	0	0
Mapembe	6	0.2	13	0.2	13	0	0
Nkhoma	13	0.2	12	0.21	12	0	0
Chilobwe	11	0.22	11	0.24	11	0	0
Ukwe	1	0.255	10	0.4975	4	6	36
Nsundwe	7	0.28	9	0.2781	10	-1	1
Chitekwere	5	0.3543	8	0.3743	7	1	1
Nsaru	2	0.405	7	0.5575	1	6	36
Mpingu	3	0.44	6	0.32	9	-3	9
Chiwamba	14	0.4667	5	0.52	2	3	9
Kalumbu	12	0.47	4	0.345	8	-4	16
Kang'oma	4	0.4889	3	0.4014	6	-3	9
Malembo	8	0.52	2	0.4433	5	-3	9
Nathenje	9	0.6914	1	0.5064	3	-2	4
						Σd^2	130
						n	14
	r=0.7143					n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 5: Design and Financial

Project	Sample	Design	Rank	Financial	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.2357	14	0	0
Mapembe	6	0.2	13	0.3714	11	2	4
Nkhoma	13	0.2	12	0.3107	13	-1	1
Chilobwe	11	0.22	11	0.3321	12	-1	1
Ukwe	1	0.255	10	0.5204	7	3	9
Nsundwe	7	0.28	9	0.502	8	1	1
Chitekwere	5	0.3543	8	0.6653	3	5	25
Nsaru	2	0.405	7	0.7464	2	5	25
Mpingu	3	0.44	6	0.5714	5	1	1
Chiwamba	14	0.4667	5	0.7524	1	4	16
Kalumbu	12	0.47	4	0.3893	10	-6	36
Kang'oma	4	0.4889	3	0.4381	9	-6	36
Malembo	8	0.52	2	0.5254	6	-4	16
Nathenje	9	0.6914	1	0.5912	4	-3	9
						Σd^2	180
						n	14
						n^3	2744
		r=0.6044				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 6: Design and Community Involvement

Project	Sample	Design	Rank	Community Involvement	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.2833	13	1	1
Mapembe	6	0.2	13	0.35	11	2	4
Nkhoma	13	0.2	12	0.3594	10	2	4
Chilobwe	11	0.22	11	0.2656	14	-3	9
Ukwe	1	0.255	10	0.6125	1	9	81
Nsundwe	7	0.28	9	0.3446	12	-3	9
Chitekwere	5	0.3543	8	0.4143	9	-1	1
Nsaru	2	0.405	7	0.4701	5	2	4
Mpingu	3	0.44	6	0.425	7	-1	1
Chiwamba	14	0.4667	5	0.575	3	2	4
Kalumbu	12	0.47	4	0.4219	8	-4	16
Kang'oma	4	0.4889	3	0.4444	6	-3	9
Malembo	8	0.52	2	0.5125	4	-2	4
Nathenje	9	0.6914	1	0.5857	2	-1	1
						Σd^2	148
						n	14
						n^3	2744
						n^3-n	2730

r=0.6767

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 7: Design and Workmanship

Project	Sample	Design	Rank	Workmanship	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.15	14	0	0
Mapembe	6	0.2	13	0.32	10	3	9
Nkhoma	13	0.2	12	0.2	13	-1	1
Chilobwe	11	0.22	11	0.27	12	-1	1
Ukwe	1	0.255	10	0.5836	2	8	64
Nsundwe	7	0.28	9	0.2743	11	-2	4
Chitekwere	5	0.3543	8	0.3657	9	-1	1
Nsaru	2	0.405	7	0.52	3	4	16
Mpingu	3	0.44	6	0.48	6	0	0
Chiwamba	14	0.4667	5	0.5067	4	1	1
Kalumbu	12	0.47	4	0.42	7	-3	9
Kang'oma	4	0.4889	3	0.4889	5	-2	4
Malembo	8	0.52	2	0.38	8	-6	36
Nathenje	9	0.6914	1	0.82	1	0	0
						Σd^2	146
						n	14
		r=0.6791				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 8: Project Planning and Contract Management

Project	Sample	Project Planning	Rank	Contract Management	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.2857	13	1	1
Chilobwe	11	0.26	13	0.2911	14	-1	1
Nkhoma	13	0.305	12	0.3643	12	0	0
Ngulube	10	0.315	11	0.4154	8	3	9
Nsundwe	7	0.3343	10	0.3027	13	-3	9
Kalumbu	12	0.4175	9	0.4107	9	0	0
Ukwe	1	0.431	8	0.3858	11	-3	9
Mpingu	3	0.44	7	0.4286	6	1	1
Malembo	8	0.4667	6	0.431	7	-1	1
Chiwamba	14	0.4733	5	0.4857	5	0	0
Chitekwere	5	0.4886	4	0.4082	10	-6	36
Kang'oma	4	0.5447	3	0.4444	3	0	0
Nsaru	2	0.6375	2	0.6964	2	0	0
Nathenje	9	0.7012	1	0.739	1	0	0
						Σd^2	67
						N	14
		r=0.8528				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 9: Project Planning and Procurement

Project	Sample	Project Planning	Rank	Procurement	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.2	13.5	0.5	0.25
Chilobwe	11	0.26	13	0.2875	12	1	1
Nkhoma	13	0.305	12	0.2	13.5	-1.5	2.25
Ngulube	10	0.315	11	0.3	11	0	0
Nsundwe	7	0.3343	10	0.3619	10	0	0
Kalumbu	12	0.4175	9	0.3813	9	0	0
Ukwe	1	0.431	8	0.5354	8	0	0
Mpingu	3	0.44	7	0.6	3	4	16
Malembo	8	0.4667	6	0.575	5	1	1
Chiwamba	14	0.4733	5	0.7	2	3	9
Chitekwere	5	0.4886	4	0.5571	6	-2	4
Kang'oma	4	0.5447	3	0.5556	7	-4	16
Nsaru	2	0.6375	2	0.85	1	1	1
Nathenje	9	0.7012	1	0.5938	4	-3	9
						Σd^2	59.5
		r=0.8692				n	14
						n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 10: Project Planning and Site

Project	Sample	Project Planning	Rank	Site	Rank	*d*	*d*d*
Ukwe	6	0.26	14	0.2	13	1	1
Nsaru	11	0.26	13	0.24	11	2	4
Mpingu	13	0.305	12	0.21	12	0	0
Kang'oma	10	0.315	11	0.15	14	-3	9
Chitekwere	7	0.3343	10	0.2781	10	0	0
Mapembe	12	0.4175	9	0.345	8	1	1
Nsundwe	1	0.431	8	0.4975	4	4	16
Malembo	3	0.44	7	0.32	9	-2	4
Nathenje	8	0.4667	6	0.4433	5	1	1
Ngulube	14	0.4733	5	0.52	2	3	9
Chilobwe	5	0.4886	4	0.3743	7	-3	9
Kalumbu	4	0.5447	3	0.4014	6	-3	9
Nkhoma	2	0.6375	2	0.5575	1	1	1
Chiwamba	9	0.7012	1	0.5064	3	-2	4
						Σd^2	68
						n	14
						n^3	2744
		r=0.8506				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 11: Project Planning and Financial

Project	Sample	Project Planning	Rank	Financial	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.3714	11	3	9
Chilobwe	11	0.26	13	0.3321	12	1	1
Nkhoma	13	0.305	12	0.3107	13	-1	1
Ngulube	10	0.315	11	0.2357	14	-3	9
Nsundwe	7	0.3343	10	0.502	8	2	4
Kalumbu	12	0.4175	9	0.3893	10	-1	1
Ukwe	1	0.431	8	0.5204	7	1	1
Mpingu	3	0.44	7	0.5714	5	2	4
Malembo	8	0.4667	6	0.5254	6	0	0
Chiwamba	14	0.4733	5	0.7524	1	4	16
Chitekwere	5	0.4886	4	0.6653	3	1	1
Kang'oma	4	0.5447	3	0.4381	9	-6	36
Nsaru	2	0.6375	2	0.7464	2	0	0
Nathenje	9	0.7012	1	0.5912	4	-3	9
						Σd^2	92
						n	14
						n^3	2744
		r =0.7978					2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 12: Project Planning and Community Involvement

Project	Sample	Project Planning	Rank	Community Involvement	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.35	11	3	9
Chilobwe	11	0.26	13	0.2656	14	-1	1
Nkhoma	13	0.305	12	0.3594	10	2	4
Ngulube	10	0.315	11	0.2833	13	-2	4
Nsundwe	7	0.3343	10	0.3446	12	-2	4
Kalumbu	12	0.4175	9	0.4219	8	1	1
Ukwe	1	0.431	8	0.6125	1	7	49
Mpingu	3	0.44	7	0.425	7	0	0
Malembo	8	0.4667	6	0.5125	4	2	4
Chiwamba	14	0.4733	5	0.575	3	2	4
Chitekwere	5	0.4886	4	0.4143	9	-5	25
Kang'oma	4	0.5447	3	0.4444	6	-3	9
Nsaru	2	0.6375	2	0.4701	5	-3	9
Nathenje	9	0.7012	1	0.5857	2	-1	1
						Σd^2	124
						n	14
		r=0.7275				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 13: Project Planning and Workmanship

Project	Sample	Project Planning	Rank	Workmanship	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.32	10	4	16
Chilobwe	11	0.26	13	0.27	12	1	1
Nkhoma	13	0.305	12	0.2	13	-1	1
Ngulube	10	0.315	11	0.15	14	-3	9
Nsundwe	7	0.3343	10	0.2743	11	-1	1
Kalumbu	12	0.4175	9	0.42	7	2	4
Ukwe	1	0.431	8	0.5836	2	6	36
Mpingu	3	0.44	7	0.48	6	1	1
Malembo	8	0.4667	6	0.38	8	-2	4
Chiwamba	14	0.4733	5	0.5067	4	1	1
Chitekwere	5	0.4886	4	0.3657	9	-5	25
Kang'oma	4	0.5447	3	0.4889	5	-2	4
Nsaru	2	0.6375	2	0.52	3	-1	1
Nathenje	9	0.7012	1	0.82	1	0	0
						Σd^2	104
						N	14
		r=0.7714				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 14: Contract Management and Procurement

Project	Sample	Contract Management	Rank	Procurement	Rank	*d*	*d*d*
Mapembe	6	0.26	14	0.2	13.5	0.5	0.25
Chilobwe	11	0.2911	13	0.2875	12	1	1
Nsundwe	7	0.3343	12	0.3619	10	2	4
Nkhoma	13	0.3643	11	0.2	13.5	-2.5	6.25
Kalumbu	12	0.4107	10	0.3813	9	1	1
Ngulube	10	0.4154	9	0.3	11	-2	4
Ukwe	1	0.431	8	0.5354	8	0	0
Mpingu	3	0.44	7	0.6	3	4	16
Malembo	8	0.4667	6	0.575	5	1	1
Chiwamba	14	0.4857	5	0.7	2	3	9
Chitekwere	5	0.4886	4	0.5571	6	-2	4
Kang'oma	4	0.5447	3	0.5556	7	-4	16
Nsaru	2	0.6375	2	0.85	1	1	1
Nathenje	9	0.7012	1	0.5938	4	-3	9
						Σd^2	72.5
						n	14
		r=0.8418				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 15: Contract Management and Site

Project	Sample	Contract Management	Rank	Site	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.2	13	1	1
Chilobwe	11	0.2911	13	0.24	11	2	4
Nsundwe	7	0.3619	12	0.2781	10	2	4
Nkhoma	13	0.3643	11	0.21	12	-1	1
Kalumbu	12	0.4107	10	0.345	8	2	4
Ngulube	10	0.4154	9	0.15	14	-5	25
Chiwamba	14	0.4857	8	0.52	2	6	36
Ukwe	1	0.5354	7	0.4975	4	3	9
Kang'oma	4	0.5556	6	0.4014	6	0	0
Chitekwere	5	0.5571	5	0.3743	7	-2	4
Malembo	8	0.575	4	0.4433	5	-1	1
Nathenje	9	0.5938	3	0.5064	3	0	0
Mpingu	3	0.6	2	0.32	9	-7	49
Nsaru	2	0.85	1	0.5575	1	0	0
						Σd^2	138
						n	14
		r=0.6967				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 16: Contract Management and Financial

Project	Sample	Contract Management	Rank	Financial	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.3714	11	3	9
Chilobwe	11	0.2911	13	0.3321	12	1	1
Nsundwe	7	0.3619	12	0.502	7	5	25
Nkhoma	13	0.3643	11	0.3107	3	8	64
Kalumbu	12	0.4107	10	0.3893	10	0	0
Ngulube	10	0.4154	9	0.2357	14	-5	25
Chiwamba	14	0.4857	8	0.7524	1	7	49
Ukwe	1	0.5354	7	0.5204	9	-2	4
Kang'oma	4	0.5556	6	0.4381	8	-2	4
Chitekwere	5	0.5571	5	0.6653	3	2	4
Malembo	8	0.575	4	0.5254	6	-2	4
Nathenje	9	0.5938	3	0.5912	4	-1	1
Mpingu	3	0.6	2	0.5714	5	-3	9
Nsaru	2	0.85	1	0.7464	2	-1	1
						Σd^2	200
						n	14
		r=0.5604				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 17: Contract Management and Community Involvement

Project	Sample	Contract Management	Rank	Community Involvement	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.35	11	3	9
Chilobwe	11	0.2911	13	0.2656	14	-1	1
Nsundwe	7	0.3619	12	0.3446	12	0	0
Nkhoma	13	0.3643	11	0.3594	10	1	1
Kalumbu	12	0.4107	10	0.4219	8	2	4
Ngulube	10	0.4154	9	0.2833	13	-4	16
Chiwamba	14	0.4857	8	0.575	3	5	25
Ukwe	1	0.5354	7	0.6125	1	6	36
Kang'oma	4	0.5556	6	0.4444	6	0	0
Chitekwere	5	0.5571	5	0.4143	9	-4	16
Malembo	8	0.575	4	0.5125	4	0	0
Nathenje	9	0.5938	3	0.5857	2	1	1
Mpingu	3	0.6	2	0.425	7	-5	25
Nsaru	2	0.85	1	0.4701	5	-4	16
						Σd^2	150
						n	14
		r=0.6703				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 18: Contract Management and Workmanship

Project	Sample	Contract Management	Rank	Workmanship	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.32	10	4	16
Chilobwe	11	0.2911	13	0.27	12	1	1
Nsundwe	7	0.3619	12	0.2743	11	1	1
Nkhoma	13	0.3643	11	0.2	14	-3	9
Kalumbu	12	0.4107	10	0.42	8	2	4
Ngulube	10	0.4154	9	0.15	14	-5	25
Chiwamba	14	0.4857	8	0.5067	3	5	25
Ukwe	1	0.5354	7	0.5836	2	5	25
Kang'oma	4	0.5556	6	0.4889	5	1	1
Chitekwere	5	0.5571	5	0.3657	9	-4	16
Malembo	8	0.575	4	0.38	7	-3	9
Nathenje	9	0.5938	3	0.82	1	2	4
Mpingu	3	0.6	2	0.48	6	-4	16
Nsaru	2	0.85	1	0.52	4	-3	9
						Σd^2	161
						n	14
						n^3	2744
		r=0.646				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 19:: Procurement and Site

Project	Sample	Procurement	Rank	Site	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.2	13	1	1
Nkhoma	13	0.2	13	0.21	12	1	1
Chilobwe	11	0.2875	12	0.24	11	1	1
Ngulube	10	0.3	11	0.15	14	-3	9
Nsundwe	7	0.3619	10	0.2781	10	0	0
Kalumbu	12	0.3813	9	0.345	7	2	4
Ukwe	1	0.5354	8	0.4975	4	4	16
Kang'oma	4	0.5556	7	0.4014	6	1	1
Chitekwere	5	0.5571	6	0.3743	8	-2	4
Malembo	8	0.575	5	0.4433	5	0	0
Nathenje	9	0.5938	4	0.5064	2	2	4
Mpingu	3	0.6	3	0.32	9	-6	36
Chiwamba	14	0.7	2	0.52	3	-1	1
Nsaru	2	0.85	1	0.5575	1	0	0
						Σd^2	78
						n	14
			r=0.8286			n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 20: Procurement and Financial

Project	Sample	Procurement	Rank	Financial	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.3714	11	3	9
Nkhoma	13	0.2	13	0.3107	13	0	0
Chilobwe	11	0.2875	12	0.3321	12	0	0
Ngulube	10	0.3	11	0.2357	14	-3	9
Nsundwe	7	0.3619	10	0.502	8	2	4
Kalumbu	12	0.3813	9	0.3893	10	-1	1
Ukwe	1	0.5354	8	0.5204	7	1	1
Kang'oma	4	0.5556	7	0.4381	9	-2	4
Chitekwere	5	0.5571	6	0.6653	3	3	9
Malembo	8	0.575	5	0.5254	6	-1	1
Nathenje	9	0.5938	4	0.5912	4	0	0
Mpingu	3	0.6	3	0.5714	5	-2	4
Chiwamba	14	0.7	2	0.7524	1	1	1
Nsaru	2	0.85	1	0.7464	2	-1	1
						Σd^2	44
						n	14
		r=0.9033				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 21: Procurement and Community Involvement

Project	Sample	Procurement	Rank	Community Involvement	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.35	11	3	9
Nkhoma	13	0.2	13	0.3594	10	3	9
Chilobwe	11	0.2875	12	0.2656	14	-2	4
Ngulube	10	0.3	11	0.2833	13	-2	4
Nsundwe	7	0.3619	10	0.3446	12	-2	4
Kalumbu	12	0.3813	9	0.4219	8	1	1
Ukwe	1	0.5354	8	0.6125	1	7	49
Kang'oma	4	0.5556	7	0.4444	7	0	0
Chitekwere	5	0.5571	6	0.4143	9	-3	9
Malembo	8	0.575	5	0.5125	4	1	1
Nathenje	9	0.5938	4	0.5857	2	2	4
Mpingu	3	0.6	3	0.425	6	-3	9
Chiwamba	14	0.7	2	0.575	3	-1	1
Nsaru	2	0.85	1	0.4701	5	-4	16
						Σd^2	120
		r=0.7363				n	14
						n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 22: Procurement and Workmanship

Project	Sample	Procurement	Rank	Workmanship	Rank	*d*	*d*d*
Mapembe	6	0.2	14	0.32	10	4	16
Nkhoma	13	0.2	13	0.2	13	0	0
Chilobwe	11	0.2875	12	0.27	12	0	0
Ngulube	10	0.3	11	0.15	14	-3	9
Nsundwe	7	0.3619	10	0.2743	11	-1	1
Kalumbu	12	0.3813	9	0.42	7	2	4
Ukwe	1	0.5354	8	0.5836	2	6	36
Kang'oma	4	0.5556	7	0.4889	5	2	4
Chitekwere	5	0.5571	6	0.3657	9	-3	9
Malembo	8	0.575	5	0.38	8	-3	9
Nathenje	9	0.5938	4	0.82	1	3	9
Mpingu	3	0.6	3	0.48	6	-3	9
Chiwamba	14	0.7	2	0.5067	4	-2	4
Nsaru	2	0.85	1	0.52	3	-2	4
						Σd^2	114
						n	14
		r=0.7495				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 23: Site and Financial

Project	Sample	Site	Rank	Financial	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.2357	14	0	0
Mapembe	6	0.2	13	0.3714	11	2	4
Nkhoma	13	0.21	12	0.3107	13	-1	1
Chilobwe	11	0.24	11	0.3321	12	-1	1
Nsundwe	7	0.2781	10	0.502	8	2	4
Mpingu	3	0.32	9	0.5714	5	4	16
Kalumbu	12	0.345	8	0.3893	10	-2	4
Chitekwere	5	0.3743	7	0.6653	3	4	16
Kang'oma	4	0.4014	6	0.4381	9	-3	9
Malembo	8	0.4433	5	0.5254	6	-1	1
Ukwe	1	0.4975	4	0.5204	7	-3	9
Nathenje	9	0.5064	3	0.5912	4	-1	1
Chiwamba	14	0.52	2	0.7524	1	1	1
Nsaru	2	0.5575	1	0.7464	2	-1	1
						Σd^2	68
						n	14
						n^3	2744
		r=0.8506				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 24: Site and Community

Project	Sample	Site	Rank	Community Involvement	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.2833	13	1	1
Mapembe	6	0.2	13	0.35	11	2	4
Nkhoma	13	0.21	12	0.3594	10	2	4
Chilobwe	11	0.24	11	0.2656	14	-3	9
Nsundwe	7	0.2781	10	0.3446	12	-2	4
Mpingu	3	0.32	9	0.425	7	2	4
Kalumbu	12	0.345	8	0.4219	8	0	0
Chitekwere	5	0.3743	7	0.4143	9	-2	4
Kang'oma	4	0.4014	6	0.4444	6	0	0
Malembo	8	0.4433	5	0.5125	4	1	1
Ukwe	1	0.4975	4	0.6125	1	3	9
Nathenje	9	0.5064	3	0.5857	2	1	1
Chiwamba	14	0.52	2	0.575	3	-1	1
Nsaru	2	0.5575	1	0.4701	5	-4	16
						Σd^2	58
						n	14
						n^3	2744
		r=0.8725				n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 25: Site and Workmanship

Project	Sample	Site	Rank	Workmanship	Rank	*d*	*d*d*
Ngulube	10	0.15	14	0.15	14	0	0
Mapembe	6	0.2	13	0.32	10	3	9
Nkhoma	13	0.21	12	0.2	13	-1	1
Chilobwe	11	0.24	11	0.27	12	-1	1
Nsundwe	7	0.2781	10	0.2743	11	-1	1
Mpingu	3	0.32	9	0.48	6	3	9
Kalumbu	12	0.345	8	0.42	7	1	1
Chitekwere	5	0.3743	7	0.3657	9	-2	4
Kang'oma	4	0.4014	6	0.4889	5	1	1
Malembo	8	0.4433	5	0.38	8	-3	9
Ukwe	1	0.4975	4	0.5836	2	2	4
Nathenje	9	0.5064	3	0.82	1	2	4
Chiwamba	14	0.52	2	0.5067	4	-2	4
Nsaru	2	0.5575	1	0.52	3	-2	4
						Σd^2	52
						N	14
		r=0.8857				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 26: Financial and Community Involvement

Project	Sample	Financial	Rank	Community Involvement	Rank	*d*	*d*d*
Ngulube	10	0.2357	14	0.2833	13	1	1
Nkhoma	13	0.3107	13	0.3594	10	3	9
Chilobwe	11	0.3321	12	0.2656	14	-2	4
Mapembe	6	0.3714	11	0.35	11	0	0
Kalumbu	12	0.3893	10	0.4219	8	2	4
Kang'oma	4	0.4381	9	0.4444	6	3	9
Nsundwe	7	0.502	8	0.3446	12	-4	16
Ukwe	1	0.5204	7	0.6125	1	6	36
Malembo	8	0.5254	6	0.5125	4	2	4
Mpingu	3	0.5714	5	0.425	7	-2	4
Nathenje	9	0.5912	4	0.5857	2	2	4
Chitekwere	5	0.6653	3	0.4143	9	-6	36
Nsaru	2	0.7464	2	0.4701	5	-3	9
Chiwamba	14	0.7524	1	0.575	3	-2	4
						Σd^2	140
						n	14
			r=0.6923			n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 27: Financial and Workmanship

Project	Sample	Financial	Rank	Workmanship	Rank	*d*	*d*d*
Ngulube	10	0.2357	14	0.15	14	0	0
Nkhoma	13	0.3107	13	0.2	13	0	0
Chilobwe	11	0.3321	12	0.27	12	0	0
Mapembe	6	0.3714	11	0.35	10	1	1
Kalumbu	12	0.3893	10	0.42	8	2	4
Kang'oma	4	0.4381	9	0.4444	6	3	9
Nsundwe	7	0.502	8	0.3446	11	-3	9
Ukwe	1	0.5204	7	0.6125	1	6	36
Malembo	8	0.5254	6	0.5125	3	3	9
Mpingu	3	0.5714	5	0.425	7	-2	4
Nathenje	9	0.5912	4	0.5857	2	2	4
Chitekwere	5	0.6653	3	0.4143	9	-6	36
Nsaru	2	0.7464	2	0.4701	5	-3	9
Chiwamba	14	0.7524	1	0.5067	4	-3	9
						Σd^2	130
		r=0.7143				n	14
						n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Table F- 28: Site and Community

Project	Sample	Community Involvement	Rank	Workmanship	Rank	*d*	*d*d*
Chilobwe	11	0.2656	14	0.27	12	2	4
Ngulube	10	0.2833	13	0.15	14	-1	1
Nsundwe	7	0.3446	12	0.2743	11	1	1
Mapembe	6	0.35	11	0.32	10	1	1
Nkhoma	13	0.3594	10	0.2	13	-3	9
Chitekwere	5	0.4143	9	0.3657	9	0	0
Kalumbu	12	0.4219	8	0.42	7	1	1
Mpingu	3	0.425	7	0.48	6	1	1
Kang'oma	4	0.4444	6	0.4889	5	1	1
Nsaru	2	0.4701	5	0.52	3	2	4
Malembo	8	0.5125	4	0.38	8	-4	16
Chiwamba	14	0.575	3	0.5067	4	-1	1
Nathenje	9	0.5857	2	0.82	1	1	1
Ukwe	1	0.6125	1	0.5836	2	-1	1
						Σd^2	42
						n	14
		r=0.9077				n^3	2744
						n^3-n	2730

$$r = \frac{1 - 6\sum d^2}{n^3 - n}$$

Appendix G: Spearman's Rank Significance Table

[A Chart for Critical Values for Spearman's rho (for a two-tailed hypothesis)]

No. of Pairs	α = 0.05	α = 0.01	α = 0.001
5	1	-	-
6	0.886	1	-
7	0.786	0.929	1
8	0.738	0.881	0.976
9	0.7	0.833	0.933
10	0.648	0.794	0.903
11	0.618	0.755	0.873
12	0.587	0.727	0.846
13	0.56	0.703	0.824
14	0.538	0.679	0.802
15	0.521	0.654	0.779
16	0.503	0.635	0.762
17	0.488	0.618	0.743
18	0.472	0.6	0.725
19	0.46	0.584	0.709
20	0.447	0.57	0.693
22	0.425	0.544	0.665
24	0.407	0.521	0.64
26	0.39	0.501	0.618
28	0.375	0.483	0.597
30	0.362	0.467	0.579
32	0.35	0.452	0.562
34	0.34	0.439	0.546
36	0.33	0.427	0.532
38	0.321	0.415	0.519
40	0.313	0.405	0.506
50	0.279	0.363	0.456
60	0.255	0.331	0.417
70	0.235	0.307	0.387
80	0.22	0.287	0.363
90	0.207	0.271	0.343
100	0.197	0.257	0.326