A STUDY ON THE USAGE OF CONSTRUCTION EQUIPMENTS

By

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Of

Department of Management Studies
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A PROJECT REPORT
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Of

MASTER OF BUSINESS ADMINISTRATION

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PROJECT COMPLETION CERTIFICATE

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This is to certify that Mr. / Ms. Sowmiya.S (Roll No. 06MBA55) a student of KCT Business School, Kumaraguru College of Technology, had undergone a project between January 10, 2008 (date of joining) and March 24, 2008 (date of leaving) titled "A Study on the Usage Pattern of Construction Equipments".

During the tenure his / her performance was **Good.**

Yours faithfully
For Sakthi Finance Ltd

R.PRAVEENA
HR Executive

KCT Business School
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BONAFIDE CERTIFICATE

Certified that this project report titled **"A Study on the usage of construction equipments"** is the bonafide work of **Ms. Sowmiya.S, 71206631055** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

Dr. K. Chitra
Project guide

Director

Evaluated and Viva Voce conducted on _____

Examiner 1

Examiner 2

DECLARATION

I, hereby declare that this project report entitled as **"A Study on the Usage of Construction Equipments"** has been undertaken for academic purpose submitted to Anna University in partial fulfillment of the requirements for the award of the degree of Master of Business Administration. The project report is the record of the original work done by me under the guidance of **Dr. K. Chitra** during the academic year 2007 – 2008.

I, also declare hereby, that the information given in this report is correct to best of my knowledge and belief.

Date:

Place: Coimbatore

Sowmiya.S

An exploratory study is carried out to understand the usage of construction equipment. Interview schedule is prepared accordingly and data is collected from 124 respondents who are construction equipment owners in the areas of Chennai, Tiruppur, Salem, Erode and Pollachi. Data is collected and analyzed using descriptive and mean score analysis.

From the analysis it was found that if customers are provided with proper knowledge regarding the various applications of construction equipments they can make use of it in a best manner. Manufacturer should provide idea about the number of times the equipment to be serviced and performance can be increased if services are done in authorized service centers.

Tippers stand first in the preference for reinvestment, so promotion of best performing tippers can be done. The company can disperse loan for the make of the equipments which have good utility value. Refinancincing can be done to the make of the equipments which have good resale value. Most of the respondents feel lack of performance is the main reason for the replacement of equipments. Performance can be maintained and improved by providing regular service to the equipments. It is always better to service the equipments in authorized centers. From the direct interaction it is found that few customers want Sakthi Finance Ltd to increase their range of products.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

India's Infrastructure sector is now in a boom phase. Infrastructure development plays an important role in the overall development of a country. Construction equipments are specially designed vehicles for executing civil engineering and construction tasks. Tippers & dumpers, Backhoe loaders, Excavators, cranes, road equipments and construction machinery are the different types of construction equipments. They are mainly used by different category of contractors. They are Category A, Category B, Category C, Hiring, Captive and others. Till recently, very little data existed on the type and utility of equipment and machinery in the construction sector in India.

Large outlay of money is involved in securing the construction equipment and such expenditure needs to be justified by way of return on investment while executing the projects.Thus ,the modern principles of management are required to be meticulously applied to all aspects of construction equipment including, selection, procurement, storage, operation and maintenance.Based on the needs of construction industry , a wide variety of construction equipment is being manufactured in India.In respect of items not being manufactured in India,facilities are available for importing such equipment mostly under Open General License

Construction work depends upon the usage of various construction equipments. profitability of the equipments mainly depends upon the application of equipments, cost involved in the maintenance and operation of equipments, utility value and resale value, situation for replacement of equipments, number of times the equipments are serviced per year. The machinery chosen should be such that it can be used repeatedly by the buyer at consistent profits, or occasionally at high profits. one factor which is often ignored in the course of a purchase decision and with detrimental results, is the availability of replacement parts. it is often wiser to discard old equipments at an opportune time rather than incur repeated costs on its maintenance.

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

I express my heartiest gratitude to Almighty God, my parents for their love and blessings to complete the project successfully.I am grateful to our Correspondent Prof. Dr. K. Arumugam, our principal Dr. Joseph V. Thanikal, Kumaraguru Collage of Technology, Coimbatore for their encouragement and inspiration. My sincere thanks to Mr. Veluswamy for giving me an opportunity to carryout a project in their organization

I express my gratitude to our Director for facilitating us to carryout our project .I extend my special thanks to Dr,Chitra for her valuable guidance and suggestions for proper orientation of the project and completion of the report.

I am also grateful to all the respondents for their cooperation in the process of data collection. I specially thank my friends for their love and support to complete my project successfully.

planning to make investment for financing infrastructure related equipments. It is essential to understand the present situation of infrastructure projects, contractors, manufacturers of infrastructure equipment and other financial institution. Heavy construction equipment consists of the following major product categories: off-highway trucks and tractors, loaders, graders and rollers, cranes and draglines, mixers and payers as well as attachments and parts. This equipment is used in a broad array of applications--ranging from major infrastructure projects to office buildings and from housing to factories, power plants and mining.

Infrastructure is important for many reasons. Sustained rapid overall growth in India is at risk if the modernization of economic infrastructure cannot keep pace with the demands—improvements in airports, ports, power and transport (rail and highway) are a potential constraint to sustained, job creating growth. Infrastructure is about more than just sustaining rapid growth, it is also central to making growth more inclusive—while airports are crucial for linking India to the world, rural roads are central to linking India to the world and ensuring rural areas gain and irrigation and water control infrastructure are essential to progress in agriculture. Moreover, infrastructure is about more than just sustaining economic gains: access to reliable and clean drinking water is fundamental, adequate sanitation (in both urban and rural areas) is a must.

Sources of construction equipment

A number of options are available in respect of obtaining construction equipment for use on any specific project.

a. Outright purchase of new equipment

This option is adopted by construction agencies in respect of items which are expected to be utilized on a number of projects during the useful life of the equipment.

Though huge initial investments are involved, the equipment so owned by the construction agency will pay for itself over its useful life and also earn substantial profits

b.Hire of Equipment

In the international market and in other developed countries, there are a number of organizations who maintain a wide variety of equipment items specifically for hiring the same to the contractors on short, medium or long -term basis.

c.Equipment owned by clients

Fragmentation of project requirements with a large number of small contracts handled by different agencies is a common phenomena in the country. In number of cases, the concerned owners, mainly government departments, provide the construction equipment on hire.

d.Export contracts

Number of Indian construction agencies have been involved in export contracts in the Middle East during the last 10 years and in the process have purchased a wide variety of sophisticated items from developed countries.

e.Leasing of Equipment

Numbers of leasing companies have sprung up all over the country and this mode of making available the equipment for construction is becoming increasingly popular.

Selecting construction equipment

The equipment used directly affects the quality of the project , and is at the same time dependent on the nature of the project. The value of any equipment has to be estimated in terms of the expense incurred on its purchase, cost of its upkeep when not in use, and its operational costs when it is being utilized. The acquisition of equipment is

considered profitable only if its expense can be neutralized by the returns accruing from its use, in addition to generating a substantial profit over and above its initial cost. The choice of the machinery should thus be such that it can be used occasionally at high profits.

Equipment Cost

On any project using equipment it is important to maintain accurate records concerning utilization, repairs and maintenance. The two main categories of equipment cost is ownership cost and operating cost.

Ownership Cost

For an expense to be classified as an ownership cost it must be incurred regardless of if the equipment is used or not. These costs are as follows:

- Purchase expense
- Salvage value
- Tax savings from depreciation
- Major repairs and overhauls
- Property taxes
- Insurance
- Storage

Operating Cost

For an expense to be classified as an operating cost it must be incurred through use of the equipment. These costs are as follows:

- Fuel
- Lubricants, lube oils, filters, and grease

- Repairs
- Tires
- Replacement of high-wear items

The biggest distinction from a cost standpoint is if a repair is classified as a *major repair* or a *minor repair*. A major repair can change the depreciable equipment value due to an extension in service life while a minor repair is normal maintenance. Major repairs are charged to the equipment and minor repairs are charged to the job. It is advantageous for projects to classify all repairs as major while the equipment department will desire to classify all repairs as "minor" and charge the work to a job.

Types of maintenance

Generally maintenance can be done in the following two ways

1. Breakdown maintenance

Breakdown of a machine can occur due to the following two reasons. Due to unpredictable failure of components which cannot be prevented and due to gradual wear and tear of the parts, which can be eliminated to a large extent by regular inspections, known as preventive maintenance.

2. Preventative maintenance

It aims to locate the sources of trouble and remove them before the breakdown occurs. Scheduled maintenance is always economical than unscheduled maintenance.

Construction

Construction is defined as any work for building, repair, renovation, refurbishment or alteration of immovable property such as a home or an industrial

building. Not just erection, but also disassembling and decommissioning of property, are included under the industry called construction.

Construction is a delicate process that involves several pieces of equipment and materials and, of course, financial investment. The type of equipment needed depends on the kind of work to be undertaken and the terrain involved. Cranes, forklifts, tractors, bulldozers, plows, skid-steer loaders, mini excavators, scrapers, etc. are some of the equipments used in construction. Depending on the nature of the job, construction may be light or heavy, and hence the equipment would also differ. Before undertaking any major construction work, the necessary permits and licenses are required from the municipal authorities. Major construction companies already possess their licenses that are issued by the governments of state. People wishing to have construction work done approach construction companies. These companies provide their expertise, labor, equipment and avow to complete the job within a fixed period of time. Delay in completion of job may oblige them to pay compensation.

The entire process of construction is legally bound by a contract signed between the person owning the property and the company carrying out the construction job on it. Some construction companies provide their expertise, but hire labor and machines from other companies. This is called as sub-contracting. All liabilities of sub-contracting lie with the companies signing the sub-contract and not with the party hiring the company.

Construction jobs also include repair and maintenance work of public utilities like freeways, flyovers, railway system, etc. These works are contracted by the construction company with the state governments and the most important clauses in them are quality and time. Procrastination in such jobs leads to public inconvenience that reflects poorly on the company apart from obliging them to pay penalties.

Construction equipment manufacturing Companies

Companies that undertake any kind of building work are called as construction companies. Their work consists building of homes, factories, academic structures, museums, etc. and even engineering projects such as building highways, bridges and dams. Construction work is generally localized at a particular site; however, some construction companies manage huge projects that may be spread over a large area or even dispersed in various locations. Construction companies do not just look after new constructions; even repair and renovation work is included in their portfolios.

Most of the organizations manufacturing construction equipment are almost exclusively engaged in indigenisation of their products and do not devote much attention to technology up gradation of equipment. Indian equipment is yet to be computerized. Artificial Intelligence gadgetry has still to be built in.

1.2 Review of Literature

This section deals with the review of literature collected from different sources;

Cliff J. Schexnayder, F.ASCE and Scott A. David(2002)[1] has undertaken a study on the development of construction equipment.the study explains the major changes in global transportation. In 1420, Giovanni Fontana was dreaming of and diagramming dredging machines. Development of the steam shovel was driven by a demand for an economical mass excavation machine to support the era of railroad construction. The Cummins diesel engine was developed in the early 1900s as the road-building phase of transportation construction began. In the short term, the basic machine frame will not change, but productivity, accuracy, and utility should improve because of enhancements.

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[1] J. Constr. Engrg. and Mgmt, July/August 2002, Volume 128, Issue 4, p 279-286

Machines will evolve into a mobile counterweight driven by an energy-efficient powerplant.

Peter F. Kaming; Paul O. Olomolaiye; Gary D. Holt; Frank C. Harris (1997)[2]has undertaken a study on variables affecting construction time and cost overruns in Indonesia. A questionnaire survey was undertaken of project managers working on high-rise construction projects in two Indonesian cities: Jakarta and Yogyakarta. The variables identified were ranked according to their perceived importance and frequencies of occurrence. Inflationary increases in material cost, inaccurate material estimating and project complexity are the main causes of cost overruns. The predominant causes of delay are design changes, poor labour productivity and inadequate planning. Using factor analysis techniques, delay and cost overrun variables were grouped into factors, and their relationships analysed. Although Indonesia specific, the results reflect construction management problems common to developing countries.

Olugboyega Adams(1997)[3] has undertaken a study on the Contractor development in Nigeria: perceptions of contractors and professionals This paper, arising from a larger study on management training needs of contractors in Nigeria, describes findings on constraints on indigenous contractors' performance in the Nigerian industry. Contractor-development programmes perceived as relevant and appropriate to improve their performance in the industry are also reported. The views of indigenous contractors and professionals were compared. There was a strong agreement between both groups on the major constraints in the industry and on the measures perceived as most important for the development of Nigerian contractors. Problems emanating from the business environment were generally perceived by both groups as the most severe constraints. More attention should be placed on contractor training to promote management development of trained construction professionals, now emerging as the new crop of construction entrepreneurs

[2] Construction Management and Economics, January 1997 , Volume 15, Issue 1 , p 83 - 94
[3] Construction Management and Economics, January 1997 Volume 15, Issue 1 , p 95 - 108

Aviad Shapira; Clifford J. Schexnayder(1999)[4] has undertaken a study on the Selection of mobile cranes for building construction projects The complicated process of selecting cranes for construction projects can be divided roughly into two main phases: (1) a general decision on the type of crane, mobile or tower; and (2) selection of the particular model according to the required size and technical specification. Several determinants of this second phase of the selection process in a typical mobile crane culture were investigated through on-site interviews with representatives of major construction companies. Factors affecting mobile crane selection were identified, classified, and rated according to their degree of influence. The involvement in equipment planning and crane selection was characterized with regard to project stages and planning parties. The findings were analysed with a view to the changing participation level of each party throughout project life. The conclusions of the study portray a picture that is different from the common assumptions about mobile crane selection, with respect to both influencing factors and the process itself.

Seung C. Ok ; Sunil K. Sinha (2006)[5] has undertaken a study on the Construction equipment productivity estimation using artificial neural network model This study develops and compares two methods for estimating construction productivity of dozer operations (the transformed regression analysis, and a non-linear analysis using neural network model). It is the hypothesis of this study that the proposed neural networks model may improve productivity estimation models because of the neural network's inherent ability to capture non-linearity and the complexity of the changeable environment of each construction project. The comparison of results suggests that the non-linear artificial neural network (ANN) has the potential to improve the equipment productivity estimation model

[4] Construction Management and Economics, July 1999 , Volume 17, Issue 4 , p 519 - 527

[5] Construction Management and Economics, Volume 24, Issue 10 December 2006 , pages 1029 - 1044

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INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 Background

Engineering vehicles, or construction equipment (sometimes referred to as earth movers), are specially designed vehicles for executing civil engineering and construction tasks.There is a vast variety in the kind of equipment used in construction depending on the type of construction. Both light and heavy construction tools are used for different types of jobs. Similarly, there is a difference in the equipment used in road construction, building construction, industrial construction, forest construction or underwater construction.

Type of construction equipments

Cranes, forklifts, bulldozers and tractors are the most needed equipment in almost all kinds of construction. Both cranes and forklifts are used to lift loads and transfer them from one point to another. The difference is that cranes are generally used to move rubble, while forklifts can lift crates or delicate but heavy materials. Bulldozers are heavy equipment used for ramming into structures and mowing them down. Tractors are heavy motorized vehicles that can be used to tug along trailers or wagons carrying loads. Besides these, construction requires hundreds of different kinds of equipment. Scrapers, plows, excavators, drills, are all different components of the construction equipment. Use of such heavy equipment requires a license from the municipal authorities.

Our country's development greatly depends upon infrastructure facilities. Currently available infrastructure facilities are inadecuate.The main objective of our government is to develop all the required infrastructure facilities .Sakthi finance ltd is

Doug Clapp , Scott Shuler ; Michael D. Nobe , Michael DeMiranda ; Mary Ellen C. Nobe(2007)[6] has undertaken a study on the Capital Equipment Acquisition in Heavy Construction Capital equipment acquisition is an important process in the heavy construction industry. A questionnaire was used to survey members of the Associated General Contractors of America and various asphalt and concrete pavement trade associations in the United States. Results suggest there is a direct correlation between the size of the company and the use of capital budgets and equipment policies as decision-making tools. Results further indicate that the chief executive officer is often the decision maker when it comes to equipment acquisition, regardless of company size.

Paul M. Goodrum , Manish Gangwar (2004)[7] has undertaken a study on The relationship between changes in equipment technology and wages in the US construction industry. This paper examines the relationship between changes in equipment technology and changes in construction wages with the help of five factors of equipment technology change: control, energy, ergonomics, functionality and information processing. Furthermore, data from the US Bureau of Labor Statistics' Current Population Survey is used to examine the effects of computer usage on wages among US hourly workers in construction. The research findings show significant relations exist between changes in equipment control, functionality and information processing with wages among non-supervisory workers.

Adam P. Cann , Alan W. Salmoni , Peter Vi , Tammy R. Eger(2003)[8] has undertaken An Exploratory Study of Whole-Body Vibration Exposure and Dose While Operating Heavy Equipment in the Construction Industry . Whole-body vibration measurements were recorded for various types of heavy equipment used within the construction industry. The purpose of these measurements was to provide more

[6] International Journal of Construction Education and Research, September 2007 , Volume 3, Issue 3 , p 159 - 178

[7] Construction management and economics, March 2004,vol 22,issue-3,p291-301.

[8] Applied Occupational and Environmental Hygiene, December 2003 ,Volume 18, Issue 12, p 999 - 1005

information about the potential levels of whole-body vibration experienced by equipment operators in the construction industry, as well as to identify types of equipment warranting further research. In total, 67 pieces of equipment were tested from 14 different equipment types. Testing took place at various construction sites including corporate, public, and residential work projects. The mobile equipment tested was associated with greater levels of whole-body vibration than the stationary equipment. When whole-body vibration levels were compared to the International Standards wheel loaders, off-road dump trucks, scrapers, skid steer vehicles, backhoes, bulldozers, crawler loaders, and concrete trowel vehicles exceeded the recommendations based on measured vibration dose values.

H. Randolph Thomas (2002)[9] conducted a study "Construction Practices in Developing Countries". This paper reviews some of the more significant differences in construction practices in developing countries. Five primary factors are discussed: cost of labor, cost of money, technology and methods, infrastructure, and role of the design professional. The hypothesis is presented that the main driving factors affecting construction practices are the cost of labor and the cost of money. These two factors place speed of construction as a secondary objective. Low labor costs lead to construction practices being labor-intensive. There is a distinct absence of construction equipment, especially small lifting devices used for material handling.

David Arditi (1997)[10] has made a study on " Innovation in Construction Equipment and Its Flow into the Construction Industry". The rate of innovation in construction equipment is measured by using two variables over a 30-year period, 1962–92: The number of new models introduced every year and the technological life of eight

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[9] J. Constr. Engrg. and Mgmt., January/February 2002, Volume 128, Issue 1, pp. 1-7

[10] J. Constr. Engrg. and Mgmt, November/December 1997 ,Volume 123, Issue 4, pp. 371-378

earthmoving equipments are considered in this study. The findings indicate that the rate of innovation in the construction equipment industry increased in the 30-year study period. The findings also suggest that these innovations are incremental in nature, stimulated by technological advances in other industries, but primarily driven by market forces. Technological advances are not confined to the industry that produces innovations. The mapping of the interindustry flow of innovations highlights that while construction companies play a predominant role in generating their own technological innovations, they are also heavily dependent on other industries, such as the construction equipment industry for the flow of technical system innovations. As such, the continuous and incremental innovations in the construction equipment industry are bound to act as a catalyst for the generation of technological advances in the construction industry.

The review of literature reveals that such exploratory study on the usage of construction equipment is scarce, particularly in the Indian context. Hence this study is undertaken.

1.3 Statement of the Problem

Sakthi Finance Ltd is planning to increase their lending for construction equipments. Infrastructure sector is very active to produce more sophisticated facilities to India. It is essential to understand the usage of current construction equipments and varied applications of construction equipment.

Usage of equipments depends upon the area of usage, owner of the equipment and the infrastructure project. It is also important to know which brand has good utility value and resale value. A better view of usage of various type of equipments used can be keep to develop strategies to capture the construction equipment market. Hence this is identified as the problem for the study.

1.4 Objective of the Study

The objectives of the study are

- To present the profile of equipments used
- To analyze the usage of construction equipments
- To identify the reasons for sale of equipments
- To identify the preferences and reasons regarding the reinvestment in construction equipments
- To analyze the perception regarding the utility and resale value of the construction equipment
- To identify the cost involved with the usage of construction equipment.

1.5 Scope of the Study

Scope of the study is to understand the views regarding the usage of the Construction Equipments. The area of study includes Tirupur, Chennai and Salem. Applications of various construction equipments and the cost involved with the usage are studied.

1.6 Methodology

1.6.1 Type of the Study

The study assumes the characteristics of exploratory research as it venture into a new area

1.6.2 Sampling Design

The Sampling Design used in this project is Convenient Sampling.Perception regarding the usage of construction equipments is collected from the 124 respondents who have availed loan for the purchase of construction equipments.

1.6.3 Method of Data Collection

The study mainly relies on primary data collected through specially designed interview schedule.

Interview schedule combines questions regarding equipment details, their applications, hours of usage, cost, perception regarding utility value and resale value, reasons for replacement, preference for reinvestment etc. A copy of interview schedule is enclosed in the annexure.

For the purpose of collecting background details regarding the construction equipment industry secondary data collected from internet, journals and newspapers and ABI inform proquest database.

1.6.4 Tools for Analysis

The tools used for analysis are

- Descriptive Analysis
- Mean-Score Analysis

1.7 Limitations

Equipment usage depends upon the area of operations and project undertaken in that location. So it is difficult to know the overall usage and applications of every equipment

1.8 Chapter Scheme

Chapter 1: Introduction

The first chapter deals with the background, objectives, scope of the study, methodology used in data collection, limitation, of the study, and brief introduction of all the chapters.

Chapter 2: Organization Profile

Organization profile includes details on the history if the organization, management and organization structure, product profile and market potential, competitive Strength of the company and brief description on various functional areas of the organization.

Chapter 3: Macro-micro Economic analysis

Macro-Micro analysis deals with the prevailing scenario of the organization with Respect to its respective industry and performs the SWOT analysis of the company.

Chapter 4: Data Analysis and Interpretation

The chapter mainly deals with analysis of the data collected from various respondents.

Chapter 5: Conclusion

Conclusion includes the result and the discussion put forth regarding the usage of the equipments.

CHAPTER-2

ORGANIZATION PROFILE

CHAPTER 2

COMPANY PROFILE

2.1 History of the Company

Sakthi Finance Ltd was promoted by Dr. N. Mahalingam during the year 1955 in the name of "The Pollachi Credit Society Private Limited". The Company was later converted into a Public Limited Company as "Sakthi Finance Limited" on 27th July 1967. SFL is engaged in the retail finance business. The Company came out with its first public issue of equity shares in 1984 and mobilised Rs.75 lakhs. In the year 1994 SFL obtained credit rating for Fixed Deposit Programe through ICRA and was rated 'MA'. Later in the Year 1995 the rating was upgraded from 'MA' to 'MA+'. The grading of the company for Fixed Deposits Programme is 'MA-'.

Company's business currently involves Acceptance of deposits, Non-Convertible Debentures, Hire Purchase Financing of commercial vehicles, Machinery etc., Mortgage Financing, and other finance related activities with its main focus on the Financing of commercial vehicles.

The total deposits mobilised by the company crossed Rs.100 crore mark in the year 1991. The company is principally engaged in hire purchase and leasing business. The stock on hire has grown steadily over the years from Rs.203.60 lakhs in 1984 to Rs. 20418.08 lacs in the financial year 2007. In compliance of the regulations, the company reduced the deposit base to less than Rs.100 crores and the deposit as on 31st March 2007 stood at Rs. 8186 lacs. As a result of the reduction in fund base, the stock on hire also dropped to Rs.11941.68 lakhs in 2001, but gradually increased to Rs.20418 lakhs in 2006-07. At present the Company has 25 branches in Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Pondicherry and Delhi.

The main objects of the company are as follows:

- To lend and / or to advance money or grant loans on any terms that may be thought fit with or without security to persons, firms, individuals, companies, local bodies or Government and particularly to customers and other persons having dealings with the Company.
- To promote, assist in promoting, finance, aid, procure aids, manage, takeover or create any undertaking whether existing or new.
- To act as Secretaries and financiers to enterprises.
- To act as an issue house, Registrars and Share Transfer Agents, Financial Advisers, Technical Consultants, System Analysts and Data Processors.
- To purchase, sell, exchange, deal in or invest in shares, debentures, bonds, Stocks of Joint Stock Companies, firms, local bodies or of Government.
- To carry on the business of Underwriters, Sub-underwriters, Brokers, Managers, Advisors, Consultants to issue of shares, debentures, bonds, fixed deposits and other securities and of syndication of loans, project finance, working capital facilities and deferred payment facilities.

2.2 Management

Dr N. Mahalingam (84 Years), Chairman Emeritus is the founder of Sakthi Group of Companies.He is the promoter of SFL. He is a graduate in Engineering and Fellow of the Institute of Engineers. He has been the founder of many Companies in diverse fields such as Transport, Sugar, Automobiles, Consumer Durables, Agriculture, Textiles, and Synthetic Gems etc. He also has been a founder of many educational institutes in Engineering, Arts and Science etc. He started his business career by joining his family business in the year 1943. He has a total experience of about six decades in various fields. Sri M Manickam (51 Years), Chairman of the Company Sri M Balasubramaniam (49 Years), Vice-Chairman and Managing Director of the Company.

Board of Directors

Composition and size of the Board

The Board of Directors consists of seven members, out of which one is a Managing Director and six are Non-Executive Directors who bring in a wide range of skills and experience to the Board. The Board has a Non-Executive Chairman and the number of independent directors is more than one-third of the total number of directors. The composition of the Board is in conformity with Clause 49 of the Listing Agreement. The Board of Directors and its Committees meet at periodic intervals.

The remuneration of each of key managerial personnel includes salary, bonus, Company's contribution to Provident Fund, Leave Travel Allowance/ Concession, Medical Expenses and value of other facilities inclusive of accommodation as may be applicable in each case. The Company has not offered any profit sharing plan to its Key Managerial Personnel.

Policy formulation, setting up of goals and evaluation of performance and control function vest with the Board. The Board has constituted four committees, namely, Audit Committee, Remuneration Committee, Shareholders'/ Investors' Grievance Committee and Asset Liability Management Committee. None of the Directors on the Company's Board is a member of more than ten committees and Chairman of more than five committees across all companies in which he is a Director.

CORPORATE GOVERNANCE

1. Company's Philosophy on Corporate Governance

The company's philosophy on corporate governance continues to aim at high levels of transparency, accountability and equity in all areas of its operations and its

dealing with members, employees, customers, lenders, regulatory and government agencies.

2. Board of Directors

a. Composition and size of the Board

The Board of Directors consists of seven members, out of which one is a Managing Director and six are Non-Executive Directors who bring in a wide range of skills and experience to the Board. The Board has a Non-Executive Chairman and the number of independent directors is more than one-third of the total number of directors. The composition of the Board is in conformity with Clause 49 of the Listing Agreement. The Board of Directors and its Committees meet at periodic intervals. Policy formulation, setting up of goals and evaluation of performance and control function vest with the Board. The Board has constituted four committees, namely, Audit Committee, Remuneration Committee, Shareholders'/ Investors' Grievance Committee and Asset Liability

b. Code of conduct

The Board of Directors, at their meeting held on 29th October 2005 adopted a Code of Conduct and Ethics ("the Code") to help ensure compliance with the legal requirements and standards of business conduct. The purpose of the Code is to deter wrong doing and promote ethical conduct.

The Code applies to all Directors and members of Senior Management Team of the company. All Board Members and personnel of the Senior Management Team of the company have affirmed compliance with the Code.

Committees of the Board

A. Audit Committee

The brief terms of reference of the Audit Committee are:

- Reviewing the accounting systems and policies periodically and suggest any improvements to the Board as and when required
- Reviewing the financial statements before they are submitted to the Board of Directors
- Reviewing the internal control systems
- Any other matters that are relevant

The committee consists of 3 non-executive directors, of which 2 are independent directors.

B. Remuneration Committee

The Remuneration Committee determines and recommends to the Board the remuneration including commission, perquisites and allowances payable to the Managing Director. During the year, the committee held a meeting on 30th June 2005 to consider the reappointment and remuneration of Managing Director. The company has complied with the non-mandatory requirement of Clause 49 regarding remuneration committee. The committee consists of 3 non-executive, independent directors.

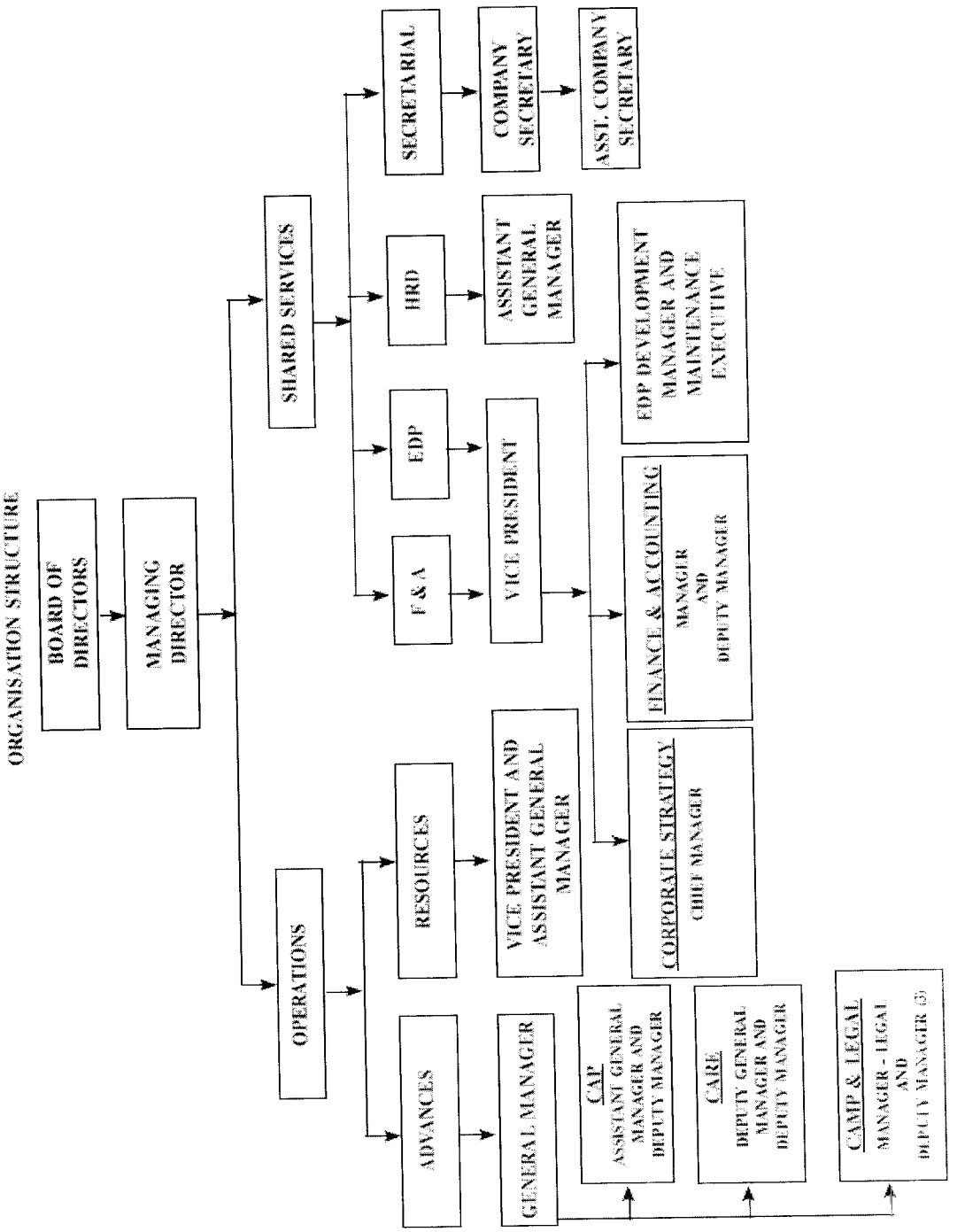
C. Shareholders' / Investors' Grievance Committee

The functions of the committee are to redress the grievances of shareholders / investors and to create and review the systems for improving the services.

D. Asset Liability Management Committee

The Asset Liability Management Committee reviews the company's fiscal and risk management policies and practices adopted by the company.

2.3 ORGANISATIONAL STRUCTURE



2.4 Product Profile

SFL is engaged in providing finance for commercial vehicles and equipments.

Commercial Vehicle Finance:

Providing finance for the Commercial Vehicles forms the core business of SFL. SFL provides finance for new as well as used commercial vehicles. The strategy of the company is to engage in niche segment of commercial vehicle refinance business. Very few organized players have entered into commercial vehicle refinance business wherein the age of the truck is more than 5 to 6 years. The average loan size for commercial vehicles varies from Rs. 2.00 Lakhs to Rs. 4.00 Lakhs and the tenure is from 24 Months to 36 Months.

Infrastructure Equipment Finance:

SFL has also entered in the financing of Infrastructure equipment and earth moving machines in order to diversify its portfolio. Government has proposed incentives for industries engaged in the infrastructure development. These incentives may give SFL an opportunity to improve in this line of business on account of the potential in equipment financing, as there is scope for growth in this business.

Market potential

SFL has outsourced this process of retail resource mobilizations to its associate company called Sakthi Financial Services Limited. Sakthi Financial Services Limited has employed around 30 field staff in Tamil Nadu to market the Fixed Deposit and Non-Convertible Debentures scheme of Sakthi Finance Limited. Potential customers are contacted and explained about the schemes and deposit is mobilised.

The marketing activity for lending is directly handled by Sakthi Finance Limited. The company has 25 branches in Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Pondicherry and Delhi. Each branch is in-charge of a Branch Manager. Depending upon the potential in the territory, 4 to 6 marketing officers are attached to each branch, At present there are 75 marketing officers in the rolls of the company. These officers are located in rural centres, wherein truck population 35 is higher. Each of these officers typically covers 50 km area from his location. They are responsible for lending money in that area and also for collecting the instalments. These officers are given required marketing support, by holding Special Customer Meets, Campaigns etc.

2.5 Competitive Strength of the Company

Strengths

- Company belongs to reputed "Sakthi Group" of companies.
- Company has been in this line of business for about five decades. Hence the knowledge of the market and customers is excellent.
- Company has well established systems required for this line of business.
- Company has loyal and dedicated man power to handle the business at all levels

2.7 Functional Departments

The Basic Process of the Business is explained below:

Lending and Collections

The processes involved in lending activity are enumerated below:-

1. Customer Acquisition and Retention (CARE): Marketing Officers located in potential centers identify good customers who intend to borrow and collect their profiles. If the profile of the intended borrower matches with the policy of the company, the

executive makes a recommendation as to whether the loan to the applicant should be extended or not.

2. Customer Appraisal Process (CAP): This process team takes care of appraising the profiles of all intended borrowers and selects the right borrowers who have the capacity and intention to repay the loan. The Appraisal process is centralized and handled at Head Office. All the branches are linked through internet and hence the appraisal process is carried out faster. The funds are advanced after the process of evaluation is completed and the necessary documentations have been completed.

3. Customer and Asset Management Process (CAMP): The critical success factor of an NBFC is its ability to manage the advance portfolio and recover the money lent on due dates. There is a team at Head Office which is continuously monitoring the recovery and offers support to branches on exceptional accounts which pose collection problems.

CHAPTER-3

MACRO AND MICRO ANALYSIS

CHAPTER - 3

MACRO- MICRO ANALYSIS

Despite being very much part of the "old economy", the heavy construction equipment industry is showing remarkable signs of vitality. Global demand for its output continues to grow at about six percent per year. After shaking off worries about financial crises in Asia, Latin America and Russia, the industry is sharing in the worldwide drive to construct new projects or to renew older public and private structures.

Heavy construction equipment consists of the following major product categories: off-highway trucks and tractors, loaders, graders and rollers, cranes and draglines, mixers and payers as well as attachments and parts. This equipment is used in a broad array of applications--ranging from major infrastructure projects to office buildings and from housing to factories, power plants and mining. The scope of use is so broad that key measures in demographics (population growth, urbanization) and aggregate macroeconomic forces (GDP, gross fixed investment, and industrial output) are the major determinants of the demand for construction equipment.

The Cyclical Global Economic Environment

Demand for heavy construction equipment is highly cyclical, as the projects that use it require substantial amounts of capital. Potential investors are more receptive when borrowing costs (interest rates) are low and when a reasonable rate of return seems assured. This scenario applies especially to privately funded projects. In contrast, public works programs are often embarked upon during recession as part of a broader fiscal stimulus

Cyclical trends tend to be shorter and more applicable in mature markets. In developing countries, the rate of sustainable economic growth is of key concern. This, in turn, influences the country's ability to attract external capital or generate its own. Short-

run factors were clearly at work, however, in the financial crises of the late 1990s in Southeast Asia, Latin America and Russia. These crises interrupted capital flows, and large-scale construction projects were canceled or delayed. Thus, demand slackened for construction equipment. A turnaround now seems to be well under way.

Reductions in tariffs and non-tariff barriers in the mid-1990s by GATT resulted in increased competition and lower costs due to economies of scale. Large machines and components can now be manufactured in fewer locations to serve the global market. Products can now move duty-free between mature markets, though some emerging countries still require local content or offsetting exports to qualify for duty-free imports.

Demand and Supply Patterns Vary by Major Regions

Regions and countries vary in their construction needs and, hence, in their demand for equipment to do the task of building and re-building. Having experienced an almost decade-long boom, the U.S. will slow down, while Western Europe will remain stable; and Japan will gradually recover. The demand for construction, and hence for equipment, in these regions is related more to upgrade and maintenance of existing infrastructure and building stock than it is to new projects.

In contrast, in the developing regions, demand for construction equipment is related to new infrastructure projects (e.g., highways, airports, rail-lines, energy generation) and urban buildings. Growth is expected in the range of seven to ten percent per annum, requiring a variety of loaders, graders, payers, and other equipment. Today, giant cranes are common sights when viewing the skylines of such varied cities as Beijing, Bangkok, Sao Paolo and Budapest.

The largest producers of heavy construction equipment are located in the U.S, Japan, Germany, the U.K. and France, followed by Italy, South Korea, Canada, Sweden and Belgium. While production takes place also in China, Russia and Latin America, suppliers in those areas are considered less competitive (in terms of world-class

manufacturing standards) and less important in international trade. But this trend is changing, with developing countries able to attract producers by offering lower material and labor costs as well as improved commitment to product quality specifications.

International Trade Flows Are Brisk, More Diverse

With global demand widespread and large-scale production limited to a dozen countries, global trade in construction equipment has been brisk, with about twenty-five percent of total output entering the foreign trade stream in any given year. Traditionally, trade has been characterized by major flows among the developed countries and extensive importing by developing countries with little indigenous production. But due to factors just cited, capacity is becoming more dispersed.

Japan has been the dominant net exporter of construction machinery in the 1990s, running a trade surplus of five billion dollars, followed by Germany and the U.K. The U.S. is also a major exporter; however, it imports equipment in sufficient quantities that it runs only a moderate-sized trade surplus. In the developing world, Brazil is a major supplier of construction equipment to its Latin American neighbors. East European countries trade with each other and export to Africa and Asia, though the region as a whole is import-dependent. South Korea emerged as a major global supplier in the 1990s. China is catering to its own needs but has the potential to be a major net exporter in the future.

Stable Product Growth, Technological Innovations and Security Issues

Product designs and manufacturing technology for construction equipment are well established, and advances are on an incremental basis. Off-highway tractors, loaders, graders, payers, mixers, cranes and other equipment incorporate automatic transmissions, electronic controls and engine monitoring systems. Many machines can now be programmed to repeat the same cycles. Other advances enhance operator comfort--air-conditioned cabs, tiltable steering wheels and noise reduction devices.

Producers are featuring global positioning satellite technology for improved surveying and for use in driver-less trucks operating on a fixed route. There are technical advances even in attachments and parts, such as buckets, blades, couplers, cutters, forks, grips, hammers and shovels.

A major concern among all users of construction equipment is security. Owners and operators are going beyond chains, steel fencing and padlocks. They are asking producers for laser-cut identification labels, keyed ignition switches, tracking systems and machines with homing devices and transmitters. A seventeen-digit global numbering system has also been proposed. While most stolen equipment has been hard to trace, it usually remains within one hundred miles of the site from where it was taken. Where this is the case, these innovations mean that recapture is much more likely. Unfortunately, however, sophisticated thieves are opting now for cross-border shipment of stolen construction equipment. Inasmuch as there are few international treaties on this topic, repossession remains a difficult task.

Equipment Rental and Leasing Provide Alternatives to Purchasing

Demand and supply dynamics in the global heavy construction equipment industry require a brief discussion of rental and leasing. Given the capital-intensive nature of most construction projects, project owners and equipment operators find it economical to rent equipment for a few hours or days rather than purchase it. Costs are lowered also for maintenance and storage, and obsolescence can be avoided as well.

From the producer's viewpoint, large rental fleets create opportunities as well as challenges (to offer more durable and varied units). Still, since the rented units are often sold after 1,500-5,000 hours of service, they constitute a large pool of used equipment competing against new equipment. One of the leaders in rentals is Case Corporation, renting both its own products as well as accessories manufactured by others. There are both captive and independent rental firms. The larger rental companies enjoy purchasing

leverage and are able to move their assets from areas of weak to areas of strong demand. A number of the rental companies are expanding globally.

Long-term leasing is another alternative to purchasing. In the U.S, the tax code creates a strong incentive to lease. In the developing countries, so-called finance leasing is in favor. It is particularly attractive to smaller contractors with tight budgets. At the end of the lease, options may include purchasing the equipment. The lack of an adequate legal framework restrains leasing in many Asian, African and Latin American countries. In Eastern Europe, Russia included, lack of financing is cited as an impediment to sales or leases, so producers must often agree to flexible arrangements. Tariff and non-tariff barriers are cited as obstacles in this region, with bureaucracy as the biggest obstacle. Russia, however, does exempt construction equipment from a value-added tax.

Micro analysis

The Indian infrastructure sector is currently going through a vast transformation. Even with the third-largest road network of 3 million kilometers crisscrossing the country, the automobile revolution has meant that the vehicle fleet on Indian roads has more than doubled from 21.3 million at the end of 1990,s to 48.4 million by the end of the decade.

The government has already embarked upon massive road construction projects, with the National Highway Development Program building the North-South and East-West Corridors and the Golden Quadrangle Project connecting major cities. Besides, the government's decision to throw open the construction of roads, bridges, airports and ports to the private sector and allowing 100% foreign investment in real estate projects has provided a boost to the construction industry as well as generate demand for construction machinery. Housing and infrastructure projects like roads, bridges and ports are expected to grow about 20% per annum for the next 15 years

The total investment of the road and highway construction projects is estimated at $40bn over the next 15 years, of which 20% is expected to be in construction machinery. Simultaneously, the housing and real estate construction business is expected to involve another $40bn over the next 15 years, of which 5% will be in construction machinery. Hence, a total demand of $10bn of construction machinery is anticipated through 2020

The present market for construction machinery is estimated at $1312.17mn, of which about 1% is imported. Both imports and domestic production is expected to grow at 20% and 30% respectively. The Indian construction machinery industry is undergoing a rapid transformation by moving from a low volume, intensive use of equipment structure to high volume, and specific use one. The major segments of construction machinery that are expected to grow are excavators, loaders, dozers, dumpers and cranes

The new and expanding housing and infrastructure construction ventures have generated substantial demand for construction machinery manufacturing and servicing, including erection, commissioning and maintenance. Several multinational firms are already present in the country. While the previous trend was to forge joint venture associations with Indian companies, more and more multinational companies are now entering the Indian market on their own strength.It is a widely acknowledged fact today that to provide the platform for a consistent eight per cent plus annual GDP growth rate and to emerge as a global super-power, India needs a truly world-class infrastructure.

For ushering in agricultural reforms, for better delivery of education, healthcare and other essential services, for development of new markets and for overall improvement in the standard of living, creation of a sound infrastructure is an essential prerequisite. This realisation has finally dawned on the Government, at both Central and State levels, and the ongoing explosive growth in infrastructure indicates that our policy makers are serious this time. The recent decision by the Government to allow 100 per cent FDI in construction is also a step in the right direction. One major beneficiary from

this big push in infrastructure has been the construction equipment industry for whom a wide gamut of opportunities has opened up.

According to a research conducted by Foundation of Infrastructure Research Studies Training (FIRST), the size of India's construction equipment industry stood at around US$ 2.3 billion in 2004 (around Rs 10,350 crore). The organized sector accounts for about 50-55 per cent of the total construction equipment industry and the industry is growing at around 25 per cent p.a. Presently, the market size of India's organized construction equipment industry is around Rs 6,500 crore. According to a very recent study, the global market size of construction equipment stands at US$ 67 billion today and growing at the rate of over five per cent p.a. Economic recovery and expansion in countries in the Asian Pacific and Latin America are the key drivers to the growth of the construction equipment industry in the coming years. In this backdrop, India is certainly one of the emerging markets for construction equipment in the global arena.

Quite naturally, the Indian market is now a happy hunting ground for equipment vendors. Apart from domestic manufacturers, renowned global vendors are also making their presence felt. Allowing 100 per cent FDI in construction and the ongoing boom - in sectors like mining, roads, housing and so on - is bound to witness the entry of a larger number of vendors.

Construction equipment usage

The major works where construction equipment can find higher usage are in the public sector. To attract more contractors, major works are split into smaller portions. The smaller works do not encourage use of construction equipment since the use of manual labour is cheaper though much slower. The cost of construction equipment has increased consistently with time. The users prefer to repair old equipment at reasonable cost than purchase a new one.

Construction equipment technology is undergoing rapid change overseas ,but the user in India remains totally isolated from such developments. Equipment manufacturers identify the technology and then educate the user about it. The small contractor continues to rely on second hand equipment. The big contractor continues to subcontract work to the small contractor.

CHAPTER-4

DATA ANALYSIS AND INTERPRETATION

CHAPTER-4

DATA ANALYSIS AND INTERPRETATION

4.1.1 Category of contractors

Table 1- Category of contractors

Category	Number of respondents	percent
Category A	41	33.06
Category B	16	12.9
Category C	11	8.87
Captive	8	6.45
Hiring	42	33.87
Others	6	4.83
Total	124	100

From the above table it can be seen that 33.06% of customers belong to category A contractors, 12.9% belong to category B, 8.87% belong to category C, 6.45% use equipments for captive purposes, 33.87% belong to hiring category and 4.83% belong to other category.

4.1.2. Profile of ownership

Table 2- Profile of ownership

egory	Tippers		Backhoe loaders		Excavators		Cranes		Road equipments		Construction machinery	
	Number owned	percent	Number owned	percent	Number owned	percent	Number owned	percent	Number owned	percent	Number owned	percent
egory A	21	38.8	24	58.5	32	61.53	14	43.75	17	80.95	19	73.07
egory B	6	11.11	2	4.87	5	9.61	5	15.625	3	14.28	3	11.5
egory C	8	14.81	-	-	2	3.84	-	-	-	-	-	-
otive	4	7.4	3	7.31	-	-	-	-	-	-	-	-
ing	13	24.07	12	29.26	9	17.3	13	40.625	1	4.76	4	15.38
ers	2	3.7	-	-	5	9.61	-	-	-	-	-	-
al	54	100	41	100	52	100	32	100	21	100	26	100

- From the above table it can be seen that 38.8% of tippers are owned by Category A respondents, 24.07% are owned by hiring category and 11.11% are owned by category C.58.5% of Backhoe loaders are owned by Category A respondents and 29.26% are owned by hiring category
- 61.53% of Excavators are owned by Category A respondents, 17.3% are owned by hiring category and 9.61% are owned by category C and category B.43.75% of cranes are owned by Category A respondents and 40.625% are by hiring category.
- 80.95% of road equipments are owned by Category A respondents and 14.28% are owned by category B.73.07% of construction machineries are owned by Category A respondents and 15.38 % are owned by hiring category

4.2. Equipment details

Total number of equipments owned and their make are described.

4.2.1. Number of Equipments owned

Table 3- Number of Equipments owned

Construction equipments	Number owned	percent
Tippers & dumpers	54	23.8
Backhoe loaders	41	18.1
Excavators	52	23
Cranes	32	14.1
Road equipments	21	9.5
Construction equipments	26	11.5
Total	226	100

From the above table it can be seen that out of total equipments 23.8% are tippers & dumpers, 18.1% are Backhoe loaders, 23% are excavators, 14.1% are cranes, 9.5% are Road equipments and 11.5% are construction equipments.

4.2.2. Make of construction equipments

Make of different construction equipments are discussed

4.2.2.1 Make of Tippers

Table 4- Make of Tippers

Make of Tippers	No. of respondents	Percentage
Ashok Leyland	23	42.5
Escorts	8	14.8
JCB	4	7.4
Tarex	4	7.4
Tata	11	20.3
Tauras	4	7.4
Total	54	100

From the above table it can be seen that 42.5%of the respondents own Ashok Leyland, 20.3% own Tata, 14.8 % prefer Escorts, 7.4 % own Jcb, Tarex, Tauras.

4.2.2.2. Make of Backhoe Loaders

Table 5- Make of Backhoe Loaders

Make of Backhoe Loaders	No. of respondents	Percentage
Ashok Leyland	4	9.7
Escorts	4	9.7
JCB	29	70.7
Tata	4	9.7
Total	41	100

From the above table it can be seen that 70.7 % of the respondents own JCB, 9.7% own Ashok Leyland, Escorts and Tata

4.2.2.3. Make of Excavators

Table 6- Make of Excavators

Make of Excavators	No. of respondents	Percentage
Hitachi	5	9.6
JCB	24	46.1
Tata	19	36.5
Volvo	4	7.6
Total	52	100

From the above table it can be seen that 46.1% of the respondents own JCB, 36.5% own Tata, 9.6% own Hitachi and 7.6% own Volvo.

4.2.2.4. Make of Cranes

Table 7-Make of Cranes

Make of Cranes	No. of respondents	Percentage
Ashok Leyland	5	15.6
AXN	12	37.5
Escorts	12	37.5
JCB	3	9.3
Total	32	100

From the above table it can be seen that 37.5% of the respondents own AXN and Escorts, 15.6% own Ashok Leyland and 9.3% JCB.

4.2.2.5. Make of Road Equipments

Table 8- Make of Road Equipments

Make of Road Equipments	No. of respondents	Percentage
Ashok Leyland	8	38.0
Joseph	1	4.7
L&T	10	47.6
Tata	1	4.7
VPG	1	4.7
Total	21	100

From the above table it can be seen that 47.6% of the respondents own L&T, 38% own Ashok Leyland and 4.7% own Joseph, Tata and VPG.

4.2.2.6. Make of Construction Machinery

Table 9- Make of Construction Machinery

Make of Construction Machinery	Number of respondents	Percentage
Ashok Leyland	2	7.6
LMW	12	46.1
L&T	2	7.6
Mec	2	7.6
Stetter	2	7.6
Tata	2	7.6
Trailers	2	7.6
VPG	2	7.6
Total	26	100

From the above table it can be seen that 46.1% of the respondents own LMW, 7.6% own Ashok Leyland, L&T, MEC, Stetter, Tata, Trailers, VPG.

4.3 Applications of construction equipments

Ranks of different applications of construction equipments are discussed.

4.3.1. Application of Tippers

Table 10- Application of Tippers

Tippers	Mean	Rank
IT parks	3.75	7
Airports	3.75	7
Bridges	2.10	3
Roads	2.07	2
Dams	2.40	4
Canals	3.29	6
Real estates	2.80	5
Others	1.86	1

From the above table it can be seen that Tippers are mainly used for other construction works followed by road construction work, bridge construction, dam construction, real estate construction, canal construction, airport construction and IT construction

4.3.2. Application of Backhoe loaders

Table 11- Application of Backhoe loaders

Backhoe loaders	Mean	Rank
IT parks	3.60	8
Airports	3.17	6
Bridges	2.09	2
Roads	2.00	1
Dams	2.33	3
Canals	3.33	7
Real estates	3.13	5
Others	2.50	4

From the above table it can be seen that Backhoe loaders are mainly used for Road works followed by bridge construction, dam construction stand, other construction work, real estate construction, airport constructions, canal construction stands and IT constructions.

4.3.3. Application of Excavators

Table 12-Application of Excavators

Excavators	Mean	Rank
IT parks	3.75	8
Airports	3.50	7
Bridges	2.11	2
Roads	1.59	1
Dams	2.36	3
Canals	3.00	6
Real estates	2.61	4
Others	2.67	5

From the above table it can be seen that Excavators are mainly used for Road works, followed by bridge construction, dam construction, real estate construction, other construction work, canal constructions, airport construction and IT construction.

4.3.4. Application of Cranes

Table 13- Application of Cranes

Cranes	Mean	Rank
IT parks	2.29	5
Airports	1.86	1
Bridges	2.06	3
Roads	2.25	4
Dams	3.00	7
Canals	4.40	8
Real estates	2.86	6
Others	2.00	2

From the above table it can be seen that Cranes are mainly used for airport construction works followed by other construction works, bridge construction, road construction work, IT park construction , real estate constructions , dam construction and canal construction stands eighth.

4.3.5. Application of Road equipments

Table 14- Application of Road equipments

Road equipments	Mean	Rank
IT parks	4.60	7
Airports	3.60	4
Bridges	2.00	2
Roads	1.00	1
Dams	2.80	3
Canals	4.00	5
Real estates	4.75	8
Others	4.04	6

From the above table it can be seen that Road equipments are mainly used for Road works followed by bridge construction, dam construction, airport construction work canal construction, other constructions work, IT park construction and real estate construction.

4.3.6. Application of Construction machinery

Table 15- Application of Construction machinery

Construction machinery	Mean	Rank
IT parks	3.83	7
Airports	2.17	4
Bridges	2.00	2
Roads	2.14	1
Dams	2.25	3
Canals	5.00	5
Real estates	4.20	8
Others	2.00	6

From the above table it can be seen that Construction machinery are mainly used for bridge construction and other construction works followed by road constructions , airport construction, dam construction work , IT park construction , real estate constructions and canal construction

4.3.7. Application of other equipments

Table 16- Application of other equipments

Other equipments	Mean	Rank
IT parks	6.00	7
Airports	5.00	6
Bridges	3.00	3
Roads	1.00	1
Dams	2.00	2
Canals	4.00	4
Real estates	4.50	5
Others	3.00	3

From the above table it can be seen that Other equipments are mainly used for Road works followed by dam construction, bridges and other construction, canal construction work, real estate construction, airport constructions and IT park construction.

4.4. Hours of usage

Hours of usage of different equipments are discussed here.

4.4.1. Hours of usage of Tippers

Table 17- Hours of usage of Tippers

Hours of usage per day	Number of responses	Percent
2	7	12.9
3	6	11.11
7	13	24.07
8	11	20.3
10	14	25.9
11	3	5.55
Total	54	100

From the above table it can be seen that 12.9% of Tippers are used 2 hours per day, 11.11% are used 3 hours per day, 24.07% are used 7 hours per day, 20.3% are used 8 hours per day, 25.9% are used 10 hours per day and 5.55% are 11 hours per day.

4.4.2. Hours of usage of Backhoe loaders

Table 18-Hours of usage of Backhoe loaders

Hours of usage per day	Number of respondents	Percent
4	8	19.5
5	10	24.3
6	8	19.5
8	9	21.95
10	6	14.63
Total	41	100

From the above table it can be seen that 19.5% of Backhoe loaders are used 4 hours per day, 24.3% are used 5 hours per day, 19.5% are used 6 hours per day, 21.95% are used 8 hours per day and 14.63% are used 10 hours per day.

4.4.3. Hours of usage of Excavators

Table 19- Hours of usage of Excavators

Hours of usage per day	Number of respondents	Percent
4	6	11.53
5	7	13.46
6	10	19.23
7	9	17.3
8	7	13.46
9	8	15.38
10	3	5.76
12	2	3.86
Total	52	100

From the above table it can be seen that 11.53% of Excavators are used 4 hours per day, 13.46% are used 5 hours per day, 19.23% are used 6 hours per day, 17.3% are used 7 hours per day, 13.46% are used 8 hours per day, 15.38% are used 9 hours per day, 5.76% are used 10 hours per day and 3.86% are used 12 hours per day.

4.4.4. Hours of usage of Cranes

Table 20- Hours of usage of Cranes

Hours of usage per day	Number of respondents	Percent
4	6	18.75
5	5	15.6
6	7	21.87
7	8	25
8	4	12.5
10	2	6.25
Total	32	100

From the above table it can be seen that 18.75% of cranes are used 4 hours per day, 15.6% are used 5 hours per day, 21.87% are used 6 hours per day, 25% are used 7 hours per day, 12.5% are used 8 hours per day and 6.25% are used 10 hours per day.

4.4.5. Hours of usage of Road Equipments

Table 21- Hours of usage of Road Equipments

Hours of usage per day	Number of respondents	Percent
6	5	23.8
7	12	5.71
8	4	19
Total	21	100

From the above table it can be seen that 23.8% of Road Equipments are used 6 hours per day, 5.71% are used 7 hours per day and 19% are used 8 hours per day.

4.4.6. Hours of usage of Construction Equipments

Table 22- Hours of usage of Construction Equipments

Hours of usage per day	Number of respondents	Percent
6	8	30.76
8	6	23.07
9	5	19.2
10	7	26.9
Total	**26**	**100**

From the above table it can be seen that 30.76% of constructions equipments are used 6 hours per day, 23.07% are used 8 hours per day, 19.2% are used 9 hours per day, 19.2% are used 5 hours per day and 26.9% are used 10 hours per day.

4.5. Cost involved per month per equipment

Maintenance cost and operating cost of various equipments are discussed.

4.5.1. Cost of Tippers

Table 23- Cost of Tippers

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	12	22.2
5000 to 10000	23	42.5	-	-
6000 to 10000	-	-	12	22.2
10000 to 20000	-	-	18	33.3
11000 to 15000	19	35.1	-	-
16000 to 20000	7	12.9	-	-
>20000	5	9.2	12	22.2
Total	54	100	54	100

From the above table it can be seen that 42.5% of the respondents have maintenance cost between 5000 to 10000, 35.1% between 11000 to 15000, 12.9% between 16000 to 20000 and 9.2% above 20000, 33.3% have Operating cost between 10000 to 20000 and 22.2% between 1000 to 5000, 6000 to 10000 and above 20000

4.5.2. Cost of Backhoe loaders

Table 24-Cost of Backhoe loaders

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	4	9.7
5000 to 10000	18	43.9	-	-
6000 to 10000	-	-	3	7.3
10000 to 20000	-	-	17	41.4
11000 to 15000	5	12.1	-	-
16000 to 20000	10	24.3	-	-
>20000	8	19.5	17	41.4
Total	41	100	41	100

From the above table it can be seen that 43.9% of the respondents have maintenance cost between 5000 to 10000, 24.3% between 16000 to 20000, 19.5% above 20000, and 12.1% between 11000 to 15000, 41.4% have Operating cost between 10000 to 20000 and above 20000, 9.7% between 1000 to 5000, and 7.3% between 6000 to 10000

4.5.3. Cost of Excavators

Table 25-Cost of Excavators

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	7	13.4
5000 to 10000	19	36.5	-	-
6000 to 10000	-	-	19	36.5
10000 to 20000	-	-	7	13.4
11000 to 15000	6	11.5	-	-
16000 to 20000	7	13.4	-	-
>20000	20	38.4	19	36.5
Total	52	100	52	100

From the above table it can be seen that 38.4% of the respondents have maintenance cost above 20000, 36.5% between 5000 to 10000, 13.4% between 16000 to 20000, and 11.5% between 11000 to 15000, 36.5% have Operating cost between 6000 to 10000 and above 20000,13.4% between 10000 to 20000 and between 1000 to 5000.

4.5.4. Cost of Cranes

Table 26- Cost of Cranes

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	4	12.5
5000 to 10000	19	59.3	-	-
6000 to 10000	-	-	16	50
10000 to 20000	-	-	8	25
11000 to 15000	2	6.2	-	-
16000 to 20000	2	6.2	-	-
>20000	9	28.1	4	12.5
Total	32	100	32	100

From the above table it can be seen that 59.3% of the respondents have maintenance cost between 5000 to 10000, 28.1% above 20000, 6.2% between 16000 to 20000 and 11000 to 15000, 50% have Operating cost between 6000 to 10000, 25% between 10000 to 20000 and 12.5% above 20000 and between 1000 to 5000

4.5.5. Cost of Road equipments

Table 27- Cost of Road equipments

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	10	47.6
5000 to 10000	12	57.1	-	-
10000 to 20000	-	-	11	52.3
11000 to 15000	9	42.8	-	-
Total	21	100	21	100

From the above table it can be seen that 57.1% of the respondents have maintenance cost between 5000 to 10000, and 42.8% between 11000 to 15000, 52.3% have Operating cost between 10000 to 20000, and 47.6% between 1000 to 5000

4.5.6. Cost of Construction machinery

Table 28- Cost of Construction machinery

Cost of the an Equipment per month (Rs)	Maintenance Cost		Operating Cost	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1000 to 5000	-	-	4	15.3
5000 to 10000	10	38.4	-	-
10000 to 20000	-	-	22	84.6
11000 to 15000	6	23.0	-	-
>20000	10	38.4	-	-
Total	26	100	26	100

From the above table it can be seen that 38.4% of the respondents have maintenance cost between 5000 to 10000, and above 20000, 23.0% between 11000 to 15000, 84.6% have Operating cost between 10000 to 20000

4.6 Utility and resale value

utility value and resale value of different make of equipments are discussed

4.6.1 Tippers-utility value

Table 29- Tippers-utility value

Make	Number of respondents	Percent
Ashok Leyland	23	42.59
Tata	31	57.4
Total	54	100

From the above table it can be seen that 42.59% of tipper owners prefer Ashok Leyland make, 57.4% feel that Tata have good Utility value.

4.6.2. Tippers-resale value

Table 30- Tippers-resale value

Make	Number of respondents	Percent
Ashok Leyland	54	100
Total	54	100

100% of Tipper owners feel Ashok Leyland make have good Resale value.

4.6.3. Backhoe loaders-utility value

Table 31- Backhoe loaders-utility value

Make	Number of respondents	Percent
Tata	12	29.26
Esorts	8	19.5
JCB	21	51.2
Total	41	100.0

From the above table it can be seen that 29.26% of Backhoe loaders owners feel TATA make have good utility value, 19.5% feel escorts and 51.2% feel JCB have good utility value.

4.6.4. Backhoe loaders-resale value

Table 32- Backhoe loaders-utility value

Make	Number of respondents	Percent
Tata	14	34.16
Esorts	9	21.95
JCB	18	43.9
Total	41	100.0

From the above table it can be seen that 26.66% of Backhoe loaders owners feel TATA make have good resale value, 6.66% feel escorts and 73.33% feel JCB have good resale value.

4.6.5. Excavators-utility value

Table 33- Excavators-utility value

Make	Number of respondents	percent
Ashok Leyland	8	15.38
Caterpillar	5	9.6
CIG	4	7.69
JCB	20	38.46
L&T	9	17.3
Tata	6	11.53
Total	52	100

From the above table it can be seen that 15.38% of Excavators owners feel Ashok Leyland make have good utility value, 9.6% feel Caterpillar, 7.89% feel CIG, 38.46% feel JCB, 17.3% feel L&T, and 11.53% feel Tata have good utility value.

4.6.6. Excavators-resale value

Table 34-Excavators-resale value

Make	Number of respondents	percent
Ashok Leyland	8	15.38
CIG	6	11.53
JCB	13	25
L&T	7	13.46
Tata	18	34.6
Total	52	100

From the above table it can be seen that 15.38 % of excavators owners feel Ashok Leyland make have good resale value, 11.53% feel CIG, 25% feel Jcb, 13.46% feel L&T and 34.6% feel Tata have good resale value.

4.6.7. Cranes-utility value

Table 35- Cranes-utility value

Make	Number of respondents	percent
ACE	9	28.125
Ashok Leyland	7	21.87
Escorts	16	50
Total	32	100

From the above table it can be seen that 28.125% of cranes owners feel ACE make have good utility value, 21.87% feel Ashok Leyland and 50% feel Escorts have good utility value

4.6.8. Cranes-resale value

Table 36- Cranes-resale value

Make	Number of respondents	Percent
ACE	9	28.125
Ashok Leyland	7	21.875
Escorts	16	50
Total	32	100

From the above table it can be seen that 28.125% of cranes owners feel ACE make have good resale value, 21.875% feel Ashok Leyland and 50% feel Escorts have good resale value.

4.6.9. Road equipments-utility value

Table 37- Road equipments-utility value

Make	Number of respondents	Percent
L&T	21	100
Total	21	100

From the above table it can be seen that L&T make have good utility value

4.6.10. Road equipments-resale value

Table 38-Road equipments-resale value

Make	Number of respondents	Percent
L&T	21	100
Total	21	100

From the above table it can be seen that L&T make have good resale value

4.6.11. Construction machinery-utility value

Table 39-Construction machinery-utility value

Make	Number of respondents	Percent
LMW	13	50
L&T	13	50
Total	26	100

From the above table it can be seen that 50% of respondents feel LMW have good utility value and 50% feel L&T have good utility value.

4.6.12. Construction machinery-resale value

Table 40- Construction machinery-resale value

Make	Number of respondents	Percent
LMW	8	30.76
L&T	18	69.2
Total	26	100

From the above table it can be seen that 30.76 % of respondents feel LMW have good resale value and 69.2% feel L&T have good resale value.

4.7. Situations for Replacement of equipments

This part analyzes the various situations under which equipments are replaced, preference for reinvestment and the reasons for reinvestment.

Table 41- Situations for Replacement of equipments

Situations for Replacement	Number of responses	Percent
Depreciation	23	16.3
Performance	42	29.7
Cost	33	23.4
Other situations	26	18.4
Low income	17	12.05
Total	141	100

From the above table it can be seen that 16.3% of feel depreciation as one of the situation for replacement, 29.7% feel performance, 23.4% feel cost, 18.4% feel other situations and 12% feel low income as the Situations for Replacement

4.8. Reasons for the sale of used equipments

This part analyses the various reasons which leads to the sale of equipments.

4.8.1. Sale of used Tippers

Table 42- Sale of used Tippers

Tippers	Mean	Rank
Reduced performance	1.55	1
Less fuel efficiency	2.22	3
obsolescence	3.50	6
Low income	1.89	2
High maintenance cost	2.27	4
Need for new models	3.67	7
Wear &tear	3.75	8
Others	3.00	5

From the above table it can be seen that Reduced performance is the first reason for the sale of used equipments followed by low income , less fuel efficiency , high maintenance cost, other reasons , obsolescence , need for new models and wear & tear .

4.8.2. Sale of used Backhoe loaders

Table 43- Sale of used Backhoe loaders

Backhoe loaders	Mean	Rank
Reduced performance	1.60	2
Less fuel efficiency	2.10	4
obsolescence	1.89	3
Low income	2.29	6
High maintenance cost	2.11	5
Need for new models	3.00	7
Wear &tear	1.33	1
Others	0.00	8

From the above table it can be seen that Wear & tear is the first reason for the sale of used equipments followed by reduced performance, obsolescence, less fuel efficiency, high maintenance cost, low income, need for new model stand and other reasons stand last.

4.8.3. Sale of used Excavators

Table 44- Sale of used Excavators

Excavators	Mean	Rank
Reduced performance	1.60	1
Less fuel efficiency	2.25	4
obsolescence	3.00	5
Low income	2.08	3
High maintenance cost	2.07	2
Need for new models	3.50	6
Wear &tear	4.00	7
others	0.00	8

From the above table it can be seen that Reduced performance is the first reason for the sale of used equipments followed by high maintenance cost , low income , less fuel efficiency cost , obsolescence, need for new models , wear & tear stand seventh and other situation.

4.8.4. Sale of used Cranes

Table 45- Sale of used Cranes

Cranes	Mean	Rank
Reduced performance	1.88	2
Less fuel efficiency	1.71	1
obsolescence	3.50	7
Low income	2.25	4
High maintenance cost	2.00	3
Need for new models	2.71	5
Wear &tear	3.00	6
others	0.00	8

From the above table it can be seen that Less fuel efficiency is the first reason for the sale of used equipments followed by reduced performance, high maintenance cost stands third, low income, need for new models, wear & tear, obsolescence stand seventh and other reasons.

4.8.5. Sale of used Road equipments

Table 46- Sale of used Road equipments

Road equipments	Mean	Rank
Reduced performance	2.33	4
Less fuel efficiency	2.00	2
obsolescence	3.33	6
Low income	1.75	1
High maintenance cost	2.20	3
Need for new models	3.00	5
Wear &tear	5.00	7
others	0.00	8

From the above table it can be seen that Low income is the first reason for the sale of used equipments followed by less fuel efficiency, high maintenance cost, reduced performance, need for new models, obsolescence, wear & tear and other reasons.

4.8.6. Sale of used Construction machinery

Table 47- Sale of used Construction machinery

Construction machinery	Mean	Rank
Reduced performance	1.00	1
Less fuel efficiency	2.00	2
obsolescence	5.00	6
Low income	2.5	3
High maintenance cost	3.00	4
Need for new models	4.5	5
Wear &tear	5.00	6
others	0.00	7

From the above table it can be seen that Reduced performance is the first reason for the sale of used equipments followed by less fuel efficiency, low income, high maintenance cost, need for new models, wear & tear and obsolescence and other reasons.

4.8.7. Sale of used Other equipments

Table 48- Sale of used other equipments

Other equipments	Mean	Rank
Reduced performance	0.00	5
Less fuel efficiency	2.22	2
obsolescence	2.43	3
Low income	2.50	4
High maintenance cost	1.94	1
Need for new models	0.00	5
Wear &tear	0.00	5
others	0.00	5

From the above table it can be seen that High maintenance cost is the first reason for the sale of used equipments followed by less fuel efficiency, obsolescence, low income stands fourth, need for new models, Reduced performance, wear & tear and other reasons.

4.9. Preference for reinvestment

Table 49-Preference for reinvestment

Preference	Mean	Rank
Tippers	1.84	1
Backhoe loaders	1.90	2
Excavators	1.93	3
cranes	2.17	4
Road equipments	2.67	6
Construction machinery	2.65	5
others	3.00	7

From the above table it can be seen that Tippers stand first in the preference for reinvestment followed by backhoe loaders, excavators, cranes, construction machinery, road equipments and other equipments.

4.10. Reasons for reinvesting

Table 50- Reasons for reinvesting

Reasons for reinvesting	Mean	Rank
Demand	1.98	3
More income	1.92	1
Expansion	2.22	4
Low maintenance cost	2.43	5
Availability of finance	2.50	6
Project requirement	1.94	2
others	4.00	7

From the above table it can be seen that Need for more income is the first reason for reinvesting followed by project requirement, demand, expansion of business, low maintenance, availability of finance and other reasons.

4.11. Number of services per year per equipment

Total number of services per year for all the equipments is discussed

4.11.1. Number of services for Tippers

Table 51- Number of services for Tippers

Service number	Number of respondents	Percent
1	12	22.22
2	8	14.8
3	9	16.66
4	6	11.11
7	9	16.66
12	10	18.5
Total	54	100.0

From the above table it can be seen that 22.22% of tippers are serviced 1 time, 14.8% of tippers are serviced 2 times, 16.66% are serviced 3 times, 11.11% are serviced 4 times, 16.66% are serviced 7 times and 18.5% are serviced 12 times.

4.11.2. Number of services for Backhoe loaders

Table 52- Number of services for Backhoe loaders

Service number	Number of respondents	Percent
1	5	12.19
2	8	19.5
3	7	17
4	8	19.51
5	10	24.3
6	3	14.63
Total	41	100.0

From the above table it can be seen that 12.19% of Backhoe loaders are serviced 1 time, 19.5% of Backhoe loaders are serviced 2 times, 17 % are serviced 3 times, 19.5 % are serviced 4 times, 24.3% are serviced 5 times and 14.63% are serviced 6 times

4.11.3. Number of services for Excavators

Table 53- Number of services for Excavators

Service number	Number of respondents	Percent
2	11	21.15
4	8	15.3
5	5	9.61
6	8	15.3
7	7	13.46
8	9	17.3
9	4	7.69
Total	52	100.0

From the above table it can be seen that 21.15% of Excavators are serviced 2 time,15.3 % of are serviced 4 Excavators times,9.61 % are serviced 5 times,15.3 % are serviced 6 times,13.46 % are serviced 7 times , 17.3% are serviced 8 times and 7.69% are serviced 9 times

4.11.4. Number of services for Cranes

Table 54- Number of services for Cranes

Service number	Number of respondents	Percent
1	7	21.87
2	6	18.75
3	3	9.375
4	2	6.25
5	2	6.25
6	6	18.75
10	1	3.12
12	5	15.62
Total	32	100

From the above table it can be seen that 21.87% of Cranes are serviced 1 time, 18.75 % of Cranes are serviced 2 times, 9.375 % are serviced 3 times, 6.25 % are serviced 4 times, 6.25 % are serviced 5 times, 18.75% are serviced 6 times, 3.12% are serviced 10 times and 15.62 % are serviced 12 times

4.11.5. Number of services for Road equipments

Table 55- Number of services for Road equipments

Service number	Number of respondents	Percent
2	17	80.9
1	4	19.04
Total	21	100

From the above table it can be seen that 80.9% of Road equipments are serviced 2 times and 19.04% are serviced 1 time.

4.11.6. Number of services for Construction machinery

Table 56-Number of services for Construction machinery

Service number	Number of respondents	Percent
3	14	53.8
2	12	46.15
Total	26	100

From the above table it can be seen that 53.8% of Construction machinery is serviced 3 times and 46.15 % are serviced 2 times.

CHAPTER-5

CONCLUSION

CHAPTER-5

FINDINGS & RECOMMENDATIONS

5.1. Category of respondents

- Most of the respondents (33.87%) belong to hiring category
- 38.8% of tippers are owned by Category A respondents, 24.07% are owned by hiring category and 11.11% are owned by category C.
- 58.5% of Backhoe loaders are owned by Category A respondents and 29.26% are owned by hiring category
- 61.53% of Excavators are owned by Category A respondents, 17.3% are owned by hiring category and 9.61% are owned by category C and category B
- 43.75% of cranes are owned by Category A respondents and 40.625% are owned by hiring category.
- 80.95% of road equipments are owned by Category A respondents and 14.28% are owned by category B.
- 73.07% of construction machineries are owned by Category A respondents and 15.38 % are owned by hiring category.

5.2. Equipment details

- Out of total equipments 23.8% are tippers & dumpers, 18.1% are Backhoe loaders, 23% are excavators, 14.1% are cranes, 9.5% are Road equipments and 11.5% are construction equipments
- Most of the respondents (42.5%) own Ashok Leyland Tippers
- Majority of the respondents (70.7%) own JCB Backhoe loaders
- Most of the respondents (46.1%) own JCB Excavators.

- Most of the respondents (37.5%) own AXN and Escorts cranes
- Most of the respondents (47.6%) own L&T Road equipments
- Most of the respondents (46.1%) own LMW construction equipments.

5.3. Applications of construction equipments

- Tippers are mainly used for other construction works
- Backhoe loaders are mainly used for Road works
- Excavators are mainly used for Road works
- Cranes are mainly used for airport construction works
- Road equipments are mainly used for Road works
- Construction machinery are mainly used for bridge construction

5.4. Hours of usage

- Most of Tippers (25.9%) are used 10 hours per day
- Most of Backhoe loaders (24.3%) are used 5 hours per day
- Most of Excavators (17.35) are used 4 hours per day
- Most of cranes (25%) are used 7 hours per day
- Most of Road Equipments (23.8%) are used 6 hours per day
- Most of constructions equipments (30.76%) are used 6 hours per day

5.5. Cost involved per month per equipment

- Most of the respondents (42.5%) have maintenance cost per month per equipment between 5000 to 10000 and 33.3% have Operating cost between Rs.10000 to Rs.20000 for Tippers

- Most of the respondents (43.9%) have maintenance cost per month per equipment between Rs. 5000 to Rs.10000 and 41.4% have Operating cost between 10000 to 20000 for backhoe loaders
- Most of the respondents (38.4%) have maintenance cost per month per equipment above 20000 and 36.5% have Operating cost between Rs. 6000 to Rs.10000 for excavators.
- Majority 59.3% of the respondents (59.3%) have maintenance cost per month per equipment between Rs.5000 to Rs.10000 and 50% have Operating cost between Rs.6000 to Rs.10000 for cranes.
- Majority of the respondents (57.1%) have maintenance cost per month per equipment between Rs. 5000 to Rs.10000, and 52.3% have Operating cost between Rs.10000 to Rs.20000.
- Most of the respondents (38.4%) have maintenance cost per month per equipment between Rs.5000 to Rs.10000 and 84.6% have Operating cost between Rs.10000 to Rs.20000.

5.6. Utility and resale value

- Most of tipper owners (57.4%) feel that Tata have good Utility value.
- 100% of Tipper owners feel Ashok Leyland make have good Resale value.
- Majority of respondents (51.2%) feel JCB make backhoe loaders have good utility value.
- Majority of respondents (73.33%) feel JCB make backhoe loaders have good resale value.
- Majority of excavators owners (38.46%) feel JCB make have good utility value.
- Most of excavators owners (25%) feel JCB make have good resale value.
- Most of crane owners (50%) feel Escort make have good utility value.
- Most of cranes owners (28.125%) feel ACE make have good resale value.
- L&T make Road equipments have good utility value.

- L&T make Road equipments have good resale value.
- 50% of respondents feel LMW have good utility value and 50% feel L&T have good utility value for construction machinery.
- Majority of respondents (69.2%) feel L&T have good resale value.

5.7. Replacement of equipments

- 16.3% of feel depreciation as one of the situation for replacement, 29.7% feel performance, 23.4% feel cost, 18.4% feel other situations and 12% feel low income as the Situations for Replacement.

5.8. Reasons for the sale of used equipments

- Reduced performance is the first reason for the sale of used Tippers.
- Wear & tear is the first reason for the sale of used Bakhoe loaders.
- Reduced performance is the first reason for the sale of used Excavators.
- Less fuel efficiency is the first reason for the sale of used Cranes.
- Low income is the first reason for the sale of used Road Equipments.
- Reduced performance is the first reason for the sale of used Construction machinery.
- High maintenance cost is the first reason for the sale of used other equipments.

5.9. Preference for reinvestment

- Tippers stand first in the preference for reinvestment.

5.10. Reasons for reinvesting

- Need for more income is the first reason for reinvesting on construction equipments.

5.11. Number of services per year per equipment

- Most of Tippers (22.22%) are serviced 1 time.
- Most of Backhoe loaders (19.5%) are serviced 2 time and 4 times.
- Most of Excavators (21.15%) are serviced 2 times.
- Most of Cranes (21.87%) are serviced 1 time.
- Majority of Road equipments (80.9%) are serviced 2 times.
- Majority of Construction machineries (53.8%) are serviced 3 times.

Recommendations

- The company can disperse loan for the make of the equipments which have good utility value.

  Tippers-Tata(57.4%), Backhoe loaders- JCB(51.2%), excavators- JCB(38.46%), cranes- Escort(50%), Road equipments- L&T(100%), construction machinery- LMW(50%) and L&T(50%)

- Refinancincing can be done to the make of the equipments which have good resale value.

  Tippers-Ashok Leyland(100%), Backhoe loaders- JCB(73.33%), excavators- JCB(25%), cranes- ACE(28.125%), Road equipments- L&T(100%), construction machinery- L&T(69.2%)

- 29% of respondents feel lack of performance is the main reason for the replacement of equipments. Performance can be maintained and improved by providing regular service to the equipments. It is always better to service the equipments in authorized centers.

- Tippers stand first in the preference for reinvestment, so promotion of best performing tippers can be done. Knowledge regarding the various applications of Tippers can be provided.

- Number of services per year is done according to the convenience of the respondents. Servicing the equipments plays an important role in the performance of the equipments. The manufacturers should create an awareness regarding regular services for the equipments. If a proper procedure is followed for servicing the equipments their performance can be maintained properly. Schemes for servicing can be provided by the manufacturers.

- From the direct interaction it is found that few customers want Sakthi Finance Ltd to increase their range of products (e.g. tractors),so it will be better to avail loan for other product which is in need by the customers.

Conclusion

Awareness regarding proper servicing of equipments among the construction equipment owners will improve the usage and performance of the equipments. Equipment manufacturers should understand the importance of Technological development and updation so that highly efficient equipments can be produced in our country. Equipment financiers can develop strategies such that providing loan for equipments with good utility and resale value.

ANNEXURE

1. Name

2. Address

3. Which category of contractors you belong to?

☐ Category A ☐ Category B ☐ Hiring

☐ Category C ☐ Captive ☐ Others

4. Equipment details

Equipment type	Owned (Nos)	Make
Tippers & Dumpers		
Backhoe Loaders		
Excavators		
Cranes		
Road Equipments		
Construction machinery		
Others		

5. Rank the application of equipments (top 3).

Purpose	Tippers	Backhoe loaders	Excavators	Cranes	Road Equipments	Construction machinery	Others
IT parks							
Airports							
Bridges							
Roads							
Dams							
Canals							
Real estates							
Others							

6. Please mention the hours of usage of each equipment

Equipments	Hours of usage/day
Tippers & Dumpers	
Backhoe Loaders	
Excavators	
Cranes	
Road Equipments	
Construction machinery	
Others	

7. Mention the Costs Involved/month in each of the machinery. (Per machinery)

Cost per month	Tippers	Backhoe Loaders	Excavators	Cranes	Road Equipments	Construction machinery	Others
Maintenance Cost							
Operating cost							

8. Mention the name of the manufacturer (make) of the asset preferred by you for its utility value and re sale value?

Equipments	Utility value	Re sale value
Tippers & Dumpers		
Backhoe Loaders		
Excavators		
Cranes		
Road Equipments		
Construction machinery		
Others		

9. Under which situation you will consider replacing your equipment?

☐ Depreciation ☐ Cost ☐ Low income
☐ Performance ☐ Others

10. Rank the reasons for the sale of the used equipment? (Top 3)

Reasons for the sale	Tippers & Dumpers	Backhoe loaders	Excavators	Cranes	Road Equipments	Construction machinery	Other
Reduced performance							
Less fuel efficiency							
Obsolescence							
Low income							
High maintenance cost							
Need for new models							
Wear & Tear							
Others							

11. When it comes to reinvesting which equipment do you prefer? Please rank. (Top 3)

	Tippers & Dumpers	Backhoe loaders	Excavators	Cranes	Road Equipments	Construction machinery	Others
Rank							

12. Rank the reasons for re-investing? (Top 3)

Factors	Rank	Factors	Rank
Demand		Availability of finance	
More income		Project requirement	
Expansion		Others	
Low maintenance cost			

13. How many times do you service your equipment per year?

	Tippers & Dumpers	Backhoe loaders	Excavators	Cranes	Road Equipments	Construction machinery	Others
Number							

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