INTRODUCTION
CHAPTER - I

INTRODUCTION

1.1 GENERAL

1.1.1 Scarce capital is the greatest bottleneck in developing countries and therefore it must be used with prudence.

1.1.2 India is a mixed economy and Socialistic pattern of society is its main aim, besides rapid and balanced economic growth, self reliance, etc. Public sector, therefore, plays a dominant role and hence investment in public sector exceeds that in private sector. The investment in public sector is of the order of 180,000 crores* for the Seventh plan. This money should be invested in the best possible projects which would optimise the national objectives, but the selection of such projects is a complex problem. So good techniques for project appraisal are vital.

1.1.3 Transport plays a very important role in the economic, social and political progress of a nation. It provides place and time utilities to both men and material. It is, therefore, indispensable to the development of trade and industry.
1.1.4 Railways are the most important mode of transport in India. They are the property of the nation and the national exchequer is their sole shareholder. They form the main arterial network of our nation's inland transport. Extending over 61,850 route kilometers\(^2\) (as on 31.3.1985), they are Asia's largest and world's second largest system under one management, next only to the railway system in the U.S.S.R. Their capital-at-charge exceeds eighty-two billion rupees.

1.1.5 Their allocation under the Sixth Plan was Rs. 5100 crores (5.1 billion rupees). However, the actual investment was Rs. 6565 crores. Railways are a capital intensive system. Investments in the Indian Railways System are very heavy. It is, therefore, necessary that the investments are made in well chosen projects, which would best serve the economic and social goals of the country. This would require the use of sophisticated project appraisal techniques like social-cost-benefit analysis and cost-effectiveness analysis.

1.2 PURPOSE OF THE STUDY

1.2.1 The primary purpose of this study is to review the techniques of project appraisal both
in theory and in practice with a view to examining their applicability to new railway-line projects in India for economic development.  

1.2.2 There is voluminous output of theoretical literature on the subject. But there are practical problems in the application of these modern techniques of project appraisal. At the same time there is utmost need for their use in the investment decision, particularly in the developing countries like India. This study is an attempt to present the various complex issues in a proper perspective. The main aim is to explore the practical applicability of the modern techniques of project appraisal and to determine their comparative merits. In particular, the applicability and utility of Social Cost Benefit Analysis to new railway line projects through backward areas have been examined with reference to a case study.  

1.3 SCOPE OF THE STUDY  

1.3.1 As the title of the study suggests, it is essentially an exploratory work to find out the appropriateness of modern project appraisal techniques for the new railway line projects in India. In particular, with the help of a case study it has been examined whether the
application of Social Cost-Benefit Analysis to a new railway line project through a backward region would lead to a change in decision on the acceptability of the project for economic development.

1.3.2 The historical background has been given to develop a historical perspective of the criteria of investment decisions in the Indian Railways.

1.3.3 Planning organisation and planning process in Indian Railways have been indicated in brief. Thereafter, theoretical guidelines of investment appraisal in Indian Railways have been given in some detail. The current practices of project appraisal have also been indicated.

1.3.4 An effort has been made to review the existing literature on the techniques of project appraisal to put it in some perspective with respect to the appraisal of transport projects. However, neither an exhaustive review nor an incisive quantified analysis of the project appraisal techniques is claimed.

1.3.5 An effort has been made to make a comparative study of the planning processes and project appraisal methodologies used in the rail-road systems of some foreign countries. Due
to inadequate availability of the relevant literature from those countries it has not been possible to make a comparative study. However, some of the available relevant literature and the replies received from GDR and Yugoslavia in response to the author's questionnaire have been included for giving some insight into the subject.

1.3.6 Thus, the present study is essentially an attempt to epitomise, review and explore the applicability and utility of the latest techniques of project appraisal to the most crucial transport undertaking of the Indian economy viz. the railways.

1.4 METHODOLOGY

1.4.1 In the last analysis, research per se, constitutes a method for the discovery of truth which is really a method of critical thinking. Thus research is essentially a systematic enquiry into the facts through objective verifiable methods either to prove or disprove a hypothesis or to discover new facts. The research work can also entail developing new techniques or methods for doing something in a better way. In this thesis an effort has been made to study the various project evaluation
techniques in some depth to have a better understanding (of them) and an effort has been made to find as to how these techniques can be used effectively in the appraisal of new line projects on Indian Railways.

1.4.2 Library Research

1.4.2.1 The first step towards critical thinking is to know in depth about what has been said on the subject in the existing literature. Though no survey of relevant literature can be claimed to be complete in view of the fast inflow of publications, an effort has been made to review the select references with a view to assimilating various techniques of project appraisal. Special emphasis was given on a study of a Discounted Cash Flow techniques, Social cost-benefit analyses and cost-effectiveness methods. However, as the purpose was to find the applicability of these techniques to railway projects, further review was made of the literature on the project appraisal methodology followed for railway projects in India and in some other countries.

1.4.2.2 Within the time available, maximum use was made of the Library facilities of Indian
1.4.3 Content Analyses of Files and Reports

Not much literature was available on project appraisal methods followed in rail transport projects. Therefore, it became necessary to do content analysis of the relevant files and project reports available in the Railway Board. A few important reports of traffic survey and traffic-cum-engineering survey prepared for the construction of new lines and electrification, etc. were studied in detail. Some case studies and reports prepared in the Planning Commission were also studied. In this connection a special mention must be made of the report by the Committee on Techniques on Financial Proposals of Railway projects prepared in 1969 which recommended introduction of Discounted Cash Flow techniques for Indian Railway projects.

1.4.4 Interviews

1.4.4.1 The content analysis of files and reports by itself was not enough. It was, therefore, supported by personal discussions with the
officials who were actually involved in the process of project appraisal. Detailed discussions were, therefore, held with the officials of the directorates of transportation, commercial, finance, planning, works, statistics and economic cell of the Ministry of Railways as also with the Advisor UNDP, Advisor PAD and Advisor of Transport in the Planning Commission.

1.4.4.2 The discussion normally centered around the methodology of project appraisal, the choice of the methods of investment worth, forecasting techniques adopted to include risk, uncertainty and inflation, evaluation of externalities, etc.

1.4.5 Comparative Study

An effort was made to make a comparative study of the planning process and project appraisal techniques used in the railway system of other countries also. As much literature was not available about the methodology followed by the railways of other countries, a questionnaire was sent to 8 countries for eliciting information in this respect. The telex was addressed to the Indian Embassies/High Commissions of UK, France, FRG, USSR, Yugoslavia, Chile, Brazil and Pakistan. However,
replies could be obtained from only FRG and Yugoslavia. Only interim replies were received from the Indian Embassies in the remaining countries.

1.4.6 The Case Study
At present DCF techniques are used to evaluate railway projects. If the Internal Rate of Return works out to 10 per cent or more, the project is considered viable. It was, therefore, decided to study in depth the traffic survey report of the Korba-Lohardaga Rail Link. It examined the proposal of construction of a new line in the resource rich backward regions of Bihar and Madhya Pradesh. This project was rejected on the ground of very low IRR (Financial). Social Cost-Benefit Analysis was therefore applied to it after detailed discussions with Dr. Adhavarya and Dr. D C Srivastava. It was found that application of Social Cost-Benefit Analysis to the project justified its acceptance.

1.5 AREAS FOR RESEARCH
During the course of the study many areas came to light which needed further research before the methodology of project appraisal could be placed on a sound footing. An attempt was therefore made to identify such areas where
conclusive answers were not available because of the various limitations. These issues have been sought to be framed for further research.

1.6 THE CHAPTER SCHEME

1.6.1 This dissertation for Ph.D contains ten chapters including this introductory chapter, which gives brief background of Indian economy and Indian Railways besides specifying the scope and purpose of this study. It also gives sources of data and the methodology followed in this research work.

1.6.2 The second chapter traces the history of Indian Railway system from its inception. It gives the development of the railway system in India in political and economic perspectives. It also gives the financial background of Indian railways besides giving the financial performance of major foreign rail-road systems.

1.6.3 The third chapter gives a comprehensive and an in-depth view of the planning process used for development of railway system in India. It examines in detail the planning organisation, the planning functions and the planning procedures of Indian Railways. It covers their modus-operandi of formulation of corporate
plans, five year plans and annual plans, their monitoring and reviews. The procedure followed by railways for investment decisions in specific projects like new lines, dieselisation, electrification, gauge conversion, yard remodelling etc. have been evaluated.

1.6.4 Next chapter gives an overview of conceptual framework for financial and economic appraisal of projects in general. The project appraisal techniques like Net Present Value, Benefit-cost Ratio, Internal Rate of Return and their inter-relationships have been critically analysed. Techniques of Cost Benefit Analysis and Cost Effective Analysis have also been discussed. The sensitivity analysis and uncertainties underlying project appraisal techniques have been examined.

1.6.5 The fifth chapter critically analyses in-depth the concept and technique of Social Cost-benefit Analysis, which has assumed strategic importance in appraisal of projects in a developing economy like India. It discusses the concept of shadow prices, method of calculation of shadow wage rate, shadow price of capital, shadow price of foreign exchange. The UNIDO and OECD methodologies and their inter-
relationship have been thoroughly examined. The procedure followed for pricing of factors of production i.e. for pricing of factors of production i.e. labour and capital has been evaluated. The analysis in this chapter substantially facilitates the actual application of this technique in the subsequent chapter on Case Study.

1.6.6 The Project Appraisal technique of Cost-Effectiveness Analysis is of great significance for those transport projects where output cannot be measured in monetary terms. Hence it was considered necessary to evaluate this technique also in all its ramifications. This constitutes the subject matter of the fifth chapter. It analysis the measures of effectiveness, cost-effectiveness function and problem of minimum cost. It also discussed the cross-over Discount Rate, Break Even Analysis and Minimum Cost Analysis, besides giving the use of this technique.

1.6.7 The seventh chapter examines the economic profile of a backward region covered by the districts of Ranchi (Bihar), Bilaspur and Raigarh (Madhya Pradesh). It describes the
forest and mineral wealth of the area and examines the industrial prospects for the area. This facilitates in estimating the potential traffic for a railway line proposed to be laid in the region.

1.6.8 The next chapter gives the details of Case Study of rail link project for this region connecting Korba and Lohardaga. It examines in detail the goods and passenger traffic that would be served by this rail link. Financial and economic appraisal of the project has been done in this chapter using techniques of Net Present Value, Benefit-cost Ratio and Internal Rate of Return separately, for diesel and stream tramissions assuming different rates of growth of traffic.

1.6.9 The ninth chapter gives a critical discussion of the results obtained from the appraisal of the Korba-Lohardaga rail link project. It also discusses the impact of rail transport on the economic development of the region.

1.6.10 The concluding chapter summarises the findings of the study and highlights the recommendations that emerge from the study.