PROJECT EVALUATION WITH SPECIAL REFERENCE TO HOUSING

A DISSERTATION

submitted in partial fulfilment of
the requirements for the award of the degree
of
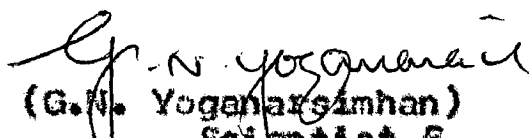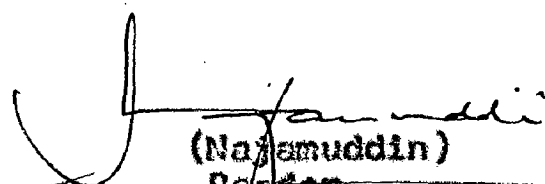### MASTER OF URBAN AND RURAL PLANNING

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CERTIFICATE

Certified that the dissertation entitled 'PROJECT EVALUATION WITH SPECIAL REFERENCE TO HOUSING' which is being submitted by Ms Nalini Singh in partial fulfilment for the award of degree of 'Master of Urban and Rural Planning, of the University of Roorkee, is a record of the student's own work carried out by her under our supervision and guidance. The matter included thethe dissertation has not been submitte for the award of any other degree or diploma. This is further to certify that she has worked from 5th January 1981 to 27th October 1981 for preparing the dissertation for the Master of Urban and Rural Planning degree of this University.

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CONTENTS

ABSTRACT

The significance of social cost benefit analysis of housing or any other project like water resources project, R and D, disease control etc., lies in the inability of commercial profitability to reflect total national gains. The aim of this thesis is to demonstrate that the prices that are obtained in the market in developing countries are not necessarily the prices that ought to be used in public sector project evaluation. The problem is to obtain national prices that the Government ought to use instead. These prices called shadow prices are values that we would want to attach to specific commodities (e.g., steel, bulldozers, fertilizers, and machine tools), or to services (e.g., unskilled labour) or to the 'act of waiting' (the rate of discount). The problem therefore is to obtain appropriate shadow prices. Also shadow price should be attached to the consumption of low income groups as price offered in the market is not a good guide to social welfare.

A rich man may offer a good deal of money for a small item, while a very poor person may find it difficult to spend even very small amounts of money on essentials. The principles of benefit-cost analyses, economic and social are explained in Chapter I. The procedure is illustrated by example of Ratnagiri Cooperative Project. A brief review of significant literature on cost benefit analysis, and

its application to housing has also been given.

The housing sector in the country and its problems are discussed in chapter II. It is pointed out that housing has a very strong potential for employment. At the rate of one million dwelling units per year, the housing sector would provide 6.3 million jobs in construction activity and construction materials industry. The organisation of the housing industry and the problems in provision of low cost housing have been discussed.

Chapter III deals with housing finance. The investments made upto the fifth five year plan, and the proposed outlays in the sixth plan have been given. The proposed sixth plan outlay of Rs. 14,900 millions is more than the total investment of the previous five plans in terms of money. Due to cost escalation, the provision is not that significant in physical terms. Even so it shows the increased realisation of the importance of this sector.

The pattern of ownership of housing (Table 9) indicates that in rural areas 94% of the houses are owned while in urban areas about 30% are rented. However due to the extremely low income of 80%, to 90% of the population in the urban areas, they are unable to pay the economic rent that a private investor expects. Hence low income housing is not being built as a profitable investment. It has to be promoted by the Government as a social policy. This highlights

the role of the public sector in this area.

In Chapter IV, three case studies have been presented The first deals with design aspects, and illustrates the methodology of economic comparison of design alternatives. The second case study analyses the returns on a block of Government flats rented to public servants on subsidised rents. The effects of shadow pricing, and price escalation have been included and discussed.

The third case study studies the economics of a Hudco Scheme of Housing on the hire-purchase system.

The conclusions and recommendations are presented in Chapter V. The findings of case study I refer to specific design alternatives. Case study II brings out the element of subsidy in Government housing and shows that it is more for low income than for high income categories. Case study III indicates that the hire purchase policies of HUDCO are reasonably remunerative to the corporation and quite fair to the purchasers.

The recommended policies for housing finance have been summarised. The steps needed to encourage private investment have been enumerated. Private ownership of land in urban areas is a major obstacle to house construction for low income groups and its solution is public acquisition of land on D.D.A pattern or public ownership of all urban land, which may then be given on lease to house builders.

CHAPTER-I

INTRODUCTION

1.1 SCOPE AND OBJECTIVE

In almost all developing countries the National Government plays an important role in formulating and evaluating investment projects, although the mix of private and public sector investment varies from one country to another. Either by direct investment in public sector or by imposing controls on private investment, or by the use of domestic taxes, tariffs, subsidies and rationing of scarce investment resources the Government is generally in a position to guide development in the country. Concomitant with this authority of the Government is the responsibility to pursue policies that are in the national interest. Projects should, therefore, be formulated and evaluated in such a way as to single out those which contribute most to the ultimate objectives of the country. It follows that the government requires a methodology for comparing and evaluating alternative projects in terms of their contributions to those objective:

The scope and objective of this thesis is to discuss the methodology of cost benefit analysis for evaluating projects with special reference to housing.

A commercial enterpeneur can confiye th his thoughts to a rather limited range of effects but a planner on behalf of the country must of necessity take a wider view. The national aspects of the housing sector and its limitations and constraints will be discussed as also the micro aspect of housing in typical case studies. In the end recommendations for a comprehensive housing policy will be made.

In the 1st chapter a brief account of cost benefit analysis has been made.

1.2 DEVELOPMENT OF COST BENEFIT ANALYSIS

The credit for the original theory of cost benefit analysis goes to the ninteenth century Frenchman Jules Dupit who seems to have been the first one to explore systematically the distinctive features of the utility function of a government. He recognized among other things consumers surplus and proposed that the benefits to the community of public enterprises like bridges and roads are not the revenues generated to the public treasury, but the public's willingness to pay, that is the sum of actual payments and consumer's surplus.

The first systematic attempt to apply benefits cost analysis to public economic decisions seems, however, to have taken place in U.S. as a result of the expansion of public investment activity especially in water resources development during the 1930s. A key document in the development of benefit cost analysis in America was the Flood Control act of 1936 which set forth the standards in the evaluation of proposals for water resources development.

This document was substantiated and revised subsequently, in 1950 in the Green Book by an interagency Committee, and then in 1952 in the Budget Circular issued by the Bureau of Budget. This was later on again reviewed in 1961 in a report called Consultants Report, according to planning criteria set forth by the Kennedy Government. A new interagency Committee was subsequently appointed to investigate water resources investment criteria and its recommendations published as Senate Document No.97, 87th Congress were approved by President Kennedy in May 1962. Since then cost benefit analysis has been applied to a wide range of problems ranging from defence to community problems like desease control.

The goal of benefit cost analysis in general can be stated as maxization of utility, subject to whatever constraints the economic and political environment imposes.

The criteria for evaluation of a project can be different. The various criteria generally followed in the evaluation are given.

Before going to the evaluation criteria it is necessary to make a few qualifications. The evaluation of a project can be carried out either to answer a yes or no question, whether the project should be taken or not, or to compare alternatives. The former approach will be adopted for evaluation in the case study for this dissertation.

1.3 EVALUATION CRITERIA

The essential issue to be resolved in the evaluation of individual projects is — what is the productivity of the project, what are its returns? These are essentially twon indices of economic merit which are used to resolve this question. The first is benefit cost criterion and the second is the internal rate of return. Each of these is discussed in turn. As will be seen these criteria should be supplemented by a third—that of net present value.

BENEFIT COST CRITERION

The benefit cost criterion of project evaluates projects by the ratio on a present value basis, of their total benefits to costs that is,

$$\text{Benefit cost ratio} = \frac{\text{Present value of all benefits}}{\text{Present value of all costs}}$$

Superficially, the benefit cost ratio appears to provide an indication of the productivity of an investment. This is only true however when one is considering a single investment and a single set of returns. In more usual case, where a project must bear both the initial capital cost and also the recurring costs of operation and maintenance the benefit cost criterion fails to provide a clear picture of the value of a project.

The benefit cost ratio usually under rates the productivity of a project with high annual costs.

INTERNAL RATE OF RETURN

The concept of internal rate of return has been proposed as an index of desirability of the projects. The higher the rate the better the project. By definition it is the discount rate at which the net present value of the benefits equals the costs. That is,

Internal rate of return =
such that using it as a discount rate
Present value of all benefits = present value of all costs.

As such it is naturally open to all the difficulties associated with the occurence of significant annual costs as indicated in the discussion of the benefit cost ratio. It has nevertheless been proposed as a measure of the true productivity of a project.

The intutivej appeal of internal rate of return is enhanced by the fact that its use would eliminate the direct need to determine the appropriate discount rate. This determination is a difficult task. This criterion is therefore used by sophisticated design agencies in a number of countries such as Mexico and France. The concept has three significant weaknesses, it can provide ambiguous values, it may provide a distorted understanding of productivity, and it may alter the evaluation of project from that indicated by the technically more correct net present value approach.

NET PRESENT VALUE

Ultimately the planner is concerned with the maximization of the value of a system, that is of its net presnt value.

This quantity is

Net present value = present value of benefits – present value of costs.

Use of the net present value criterion avoids each of the economic difficulties associated with benefit cost and internal rate of return criteria. First it avoids the complication introduced by question of annual operating cost by simple expedient of focussing directly on the net benefits. Second because the implied reinvestment costs are consistent, it does not produce ambiguous results as
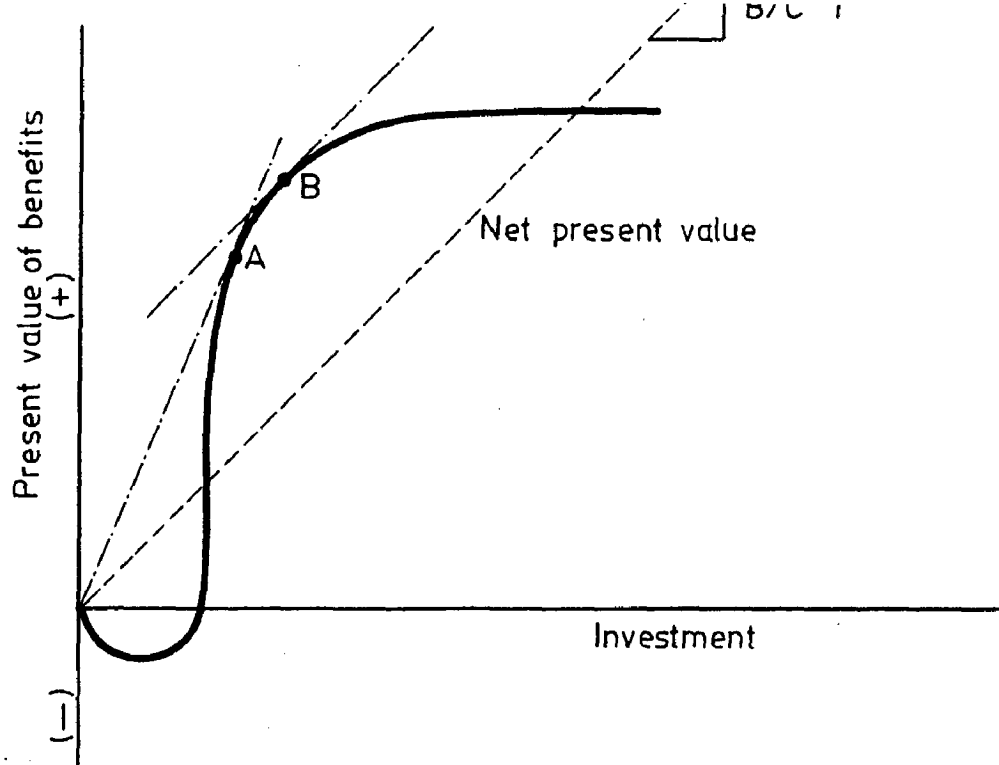
Fig.1   The projects chosen by benefit cost criterion (A) and the net present value criterion (B) are not identical when the level of investmet can be varied

Fig.2   The project chosen by the internal rate of return criterion (C) and the net present value (B) are not identical when the level of investment can be varied

can the internal rate of return. Finally by charging the
capital with its real apportunity cost rather than with
internal rate of return it provides a more accurate assess-
ment of the net contribution of any project to present valu

The difference between the net present value,
benefit cost criterion, and internal rate of return for
single projects are illustrated in figs. 1 and 2. The solid
lines in both figures represent the actual returns. These
are supposed to be negative for small levels of investment
which might not be able to cever the fixed overhead costs.
If the actual returns were positive for all levels of
investment and if the emperical law of diminishing marginal
returns held throughout, then the internal rate of
return and benefit cost criterion wouldbboth suggest
that the best investment is the smallest one. As it is
the figures indicate that these criteria can clearly be
different from the net present value criterion.

1.4 SOCIAL COST BENEFIT ANALYSIS

In the evaluation criteria described above many
problems stay unresolved. These problems relate to national
welfare the objectives of which are given briefly below:
The methodology evolved for the quantification of these
objectives will be illustrated in the case study.

bearing on the money benefits derived from investment in housing.

A practical application of the benefit-cost methodology described above would require statistical data relating. To :-

(a)   Prices of materials used in construction.

(b)   Quantities required for construction.

(c)   Wages of skilled and unskilled labour and

(d)   Rates of interest on loanable funds for investment.

For isolating the tax component it would be further necessary to know the tax component of prices and wages. To enable this study the detailed information regarding the supply and demand position and its elasticity of supply and demand would be required.

In the second and third chapter the macro-economics of housing has been discussed while in the fourth chapter a micro-study on rental housing scheme for low-income government employee has been done. In the last chapter recommendations for a revised housing policy havebeen given.

1.6 LITERATURE SURVEY

Some of the important references on cost-benefit analysis are briefly discussed below:

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1) AGGREGATE CONSUMPTION

The raising of standard of living is a fundamental goal of national planning. One important measure of standard of living is the level of aggregate consumption per head. The raising of this level may be called aggregate consumption objective which is clearly a crucial objective for project choice.

2) TO REDISTRIBUTE CONSUMPTION

Especially the increments provided by growth to lower income groups and regions in order to achieve greater equality. Thus higher weightage will be given to the aggregate consumption in lower income groups and regions.

3) EMPLOYMENT LEVEL

An expansion of employment level or more specifically a reduction of unemployment is usually treated as one of the objectives of social cost benefit analysis. One particular argument for avoiding unemployment is that the unemployed tend to lose their skills and expertise through lack of practice.

4) SELF RELIANCE

Many developing countries are severely dependent on richer countries for their economic development efforts because of chronic shortages of savings or of foreign

exchange. To reduce dependence on foreign countries and to develop self reliance may be treated as a goal.

5) MERIT WANTS

Though merit wants are generally associated with social projects but even industrial project may contribute towards this objective. For example if an industrial project is located in a back-ward area it brings the people of that region in contact with educational facilities and housing for the employees of that area who are employed as unskilled labour.

1.5 COST BENEFIT AS APPLIED TO HOUSING

Any comprehensive study of investment in housing must take account of a number of complicated and inter related problems like measurement of utilities, definition of public interest, attitudes to housing welfare and impact of politics on economic decisions.

Given the demand of housing, the effects of fiscal and monetary policy on investment in housing are a resultant of the effects in two directions. The first direction availability of funds for investment and cost of housing, and the other income stream which the investment in housing is expected to generate over the life time of house.

The difference between reciepts and cost is not just a simple sum of gains minus costs, because the worth depends upon the time at which a cost is incurred or gain received. In order to follow these diffrences, the income stream from a house, that is the rents expected over the years should be discounted and converted to present worth. The present worth should be compaired with annual equivalent of capital costs. If B represents benefits in terms of income from investment in housing, and C represents the annual equivalent of capital costs plus interest plus depreciation and maintenance then B/C represents the benefit cost ratio.

The costs of construction are affected by the time, level and structure of taxes as well as the rate of interest. Subsidies and grants for housing will have incentive effects. From the point of view of individual investor, the receipts of subsidies may be looked upon as reduction in costs. From the national point of view, however, subsidies represent only a transfer and hence cannot be deducted from the costs.

The rate of interest has a direct bearing on the costs of construction. If monetary policy tends in the direction of higher interest rates, it means that to that extent interest is a part of the cost of construction, it raised the cost. The rate of interest not only affects the cost of construction, but also has an important

bearing on the money benefits derived from investment in housing.

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Values for Money by Michael J. Frost[1] first explains what is meant by economic decisions. He distinqui‐ shes between business and public decisions and discusses the techniques of forecasting. He then develops the theoretical background. After explaining the basic economic concepts he discusses quantification of forecasts the equivalence of present and future expenditure and weighting terms to account for social factors. The procedure of cost benefit analysis has been illustrated by a detailed discussion of the Roskill Commission report on Third London Airport. Several other illustrative examples are also given.

The experience gained by UNIDO in the methodology and practice of national Benefit Cost Analysis for inindustrial projects, is given in a publication entitled[2] Guide line for project evaluation United Nations publica‐ tion. The book first deals with the rationale of Social Cost Benefit Analysis and the national parameters involved. It emphasized that national parameters are concerned not only with value judgements and national objectives but also with systematic use of all relevant facts. The limitations of commercial profitability criterion have been brought out followed by a discussion of national economic profitability.

The next stage of discussion deals with the measurement of direct benefits and direct costs. The direct benefits are measured quantitatively in terms of increase in aggregate consumption. This has to be valued in money terms on basis of existing prices as well as anticipated price when the additional production comes into the market.

Latter on the indirect benefit and costs have been discussed. A chapter is devoted to the redistribution objective which is important in all developing countries with large disparities of income and wealth. Equally important is the objective of providing additional employment which is discussed in the next chapter.

In the next part of the book the applications of these concepts to national planning are discussed. These include the social value of investment, the shadow wage in a surplus labour economy and the value of foreign exchange. Then four illustrative case study have been discussed in detail dealing with industrial projects and one with a water resources project.

After a brief introduction on cost benefit analysis M.G. Kendall[3] deals with applications and illustrative case studies to the following types of problems.

1. Health and Community Services:

These include disease control, rural water supply, employment problems of disadvantaged youth.

2. Defence and R and D

3. Natural resources for example Forestry, water resources planning etc.

4. Transport

5. Investments.

These case studies have been presented in the form of papers by different authors.

The International Bank for Reconstruction and Development has published working Paper no. 194, Feb.1975 on Economic Analysis of Projects[4] In this paper the general approach to economic analysis recommended for use by the Bank staff is given. The earlier appraisal by the Bank was purely of economic returns and did not take into account the effect of the Project on the distribution of income, on government revenue, on savings and other social benefits. The hand book argues that such benefits should be taken into account in Project analysis. It shows how shadow prices can be estimated incorporating social impacts. Based on these social values of inputs and outputs, rates of social return can be calculated. These are more significant indication of the merit of the projec-t

in the interest of the people, than a purely economic
rate of return.

The hand book is divided into three parts. Part I
discusses the basic concepts of cost benefit analysis. It
includes chapters on Identification of relevant costs and
benefits, valuation and shadow pricing, investment criteria
and problems of uncertainty and rest. Part II is devoted
to detailed discussion of derivation of shadow prices. It
describes the methodology of obtaining social welfare
function, the derivation of weights shadow wage rates and
commodity prices. Part III then illustrates the use of
methodology developed in Part II to estimate shadow prices.

The handbook is a very comprehensive useful and
practical guide book to evaluate the over all merits of
a proposed project.

E.J. Mishan explains[5] the principles of cost benefit
analysis in simple language avoiding the use of complex
mathematical technique. Contrary to the common practice of
just explaining the principles and then giving examples
to illustrate those principles the author first gives some
simple examples to arouse the interest and curiosity of
the reader and then goes to discuss the principles.

The economic concept of sonsumers surplus, rent and producers surplus are explained followed by transfer payments and shadow pricing. The next part deals with external effects, both benificial and detrimental e.g. cost reduction by improved technique by the one firm forces all others in the same industry to reduce costs. Deterimental environment effects are not confined to manufacturer but effect the general public. Based on these the author then discusses investment criteria and selection of investment project.

The problem of uncertainty and the use of probabilistic approach has been explained. Finally the social basis of welfare economics has been discussed.

The book stimulates and maintains the interest of the reader and requires prior knowledge of simple mathematics and economics only.

Stephen A. Margtin[6] gives a brief history of benefit cost analysis and then brings out its importance in a planned economy. It stresses that benefit cost analysis in Indian Planning ought to differ from that in U.S.A. Investment criteria for the public sector should be related to the objectives of growth. The book covers the usual ground of the theory of benefit cost analysis with particular referenceto public cost analysis.

Mishra and Beyes[7] describe a case study of the Ratnagiri fisheries Project.

In 1970 the government of Maharashtra sanctioned the Ratnagiri Co-operative Project. The project has four components which are closely related to each other (1) the procurement and operation of thirty 15-tonne trawlers, (2) the establishment of service station for maintenance of the trawlers (3) the development of 5-tonne capacity freezing plant complex for the preparation of frozen prawns for export and (4) the construction of a 10-12 tonne capacity ice factory. At the time of Government sanction total investment costs of the project (excluding ice factory which was added later) were estimated to be Rs. 35.30 lakh, and it was expected that all components of the project would be fully operational by the end of the second year of this amount. ARC agreed to provide Rs. 23.47 lakh in the form of loans with the state Government provi-ding the balance in form of equity participation.

Both the Government and ARC based their approval of the project in part on "unit economics" studies done separately for each component of the project to determine their profitability. The Unit Economics of Trawlers is summarized in table 1, to illustrate this approach. In brief, this analysis estimated (for one typical year in

full operation) total cost incurred and total income received by the trawler operator, with the difference between them representing the trawlers annual profit. Costs included interest payments and repayment of bank loan. Since each component of the project showed a positive profit the project was approved.

However, the analysis was incomplete in several important respects. The principal short comings of this analysis are outlined briefly below:

TABLE I UNIT ECONOMICS OF TRAWLDERS
(For one trawler)

	Rupees
Annual Expenditure	
1. Fuel	1300
2. Maintenance	2300
3. Wages	12420
4. Insurance	2025
5. Marketing commission	750
6. Interest on working capital	552
7. Depreciation	7600
8. Interest on ARC loan	3845
9. Repayment of ARC loan	3845
10. Unforseen expenditure	1186
Total costs	46000

Annual receipts

1. Sale of prawns for freezing		12000
2. Sale of prawns in the market		12000
3. Sale of other fish in the market		24000
4. Interest on depreciation fund		456
	Total Receipts	48456
	Net Profit	2456

1) The analysis estimates the projects profitability only with respect to the owners or operators of the project, but not to the national economy, or society.

2) Estimating the volume of profit in a typical year does not permit a comparison of projects and hence a choice of the best investment opportunities.

3) The analysis does not recognize that projects costs and benefits have different values on when they are incurred or received.

4) Although this project is intended to assist a backward community in a backward district, the profitability analysis does not specifically attach any higher social weight on their potential benefits.

5) The analysis, values costs and benefits at market and official price although there is good reason to expect such prices to be often poor indicators of the value or cost to India of certain inputs (such as unskilled labour and foreign exchange)

6)   Similarly the analyse does not examine relative price changes expected to occur in the future, particularly for an exportable commodity like prawns which has shown a market upward trend in comparison to other prices in the project.

7)   The analysis does not evaluate possible modifications in the project (we might call them technical alternatives internal to the project) which might yield a higher profitability than the project as presently formulated.

8)   The analysis assumed that all its estimates on costs and returns are accurate and will be realised though we know, absolute certainty of future of estimate is a rare event. Therefore, the analysis does not test the sensivity of the projects profitability, with respect to projects uncertain variables.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS:

The dominant conclusion of the analysis is that the Ratnagiri Fisheries Project has high social profitability. The internal rate of return (IRR) ranges from 17 to 26 percent with large net present values (NPV) at a social rate of discount of 10 percent. A partial summary of the profitability of the project is given in Table. 2.

TABLE 2- SUMMARY OF PROFITABILITY OF THE RATNAGIRI
FISHERIES PROJECT.

	Net present value (Rs.1000)	Internal rate of return (percent)
A. Social Profitability with		
1. Aggregate consumption benefits at market prices	23,07	17-18
2. Aggregate consumption benefits at accounting prices	57,02	26
a) only accounting wage rate	24,08	18-19
b) only accounting price of foreign exchange	56,01	25-26
3. Aggregate consumption with regional distribution benefits	29,25	19-20
B. Technical Alternatives		
(change in NPV compared to A.1)		
1. Large capacity freezing plant	+ 7,70	
2. Larger size trawlers	+47,83	
3. One year implementation period	+ 6,38	
4. Postponement by four years	(-)3,64	
C. Private Profitability		
1. Federation(complete project)		17-18
2. Freezing plant complex		29-30
3. Trawler operators		9-10

The analysis of the technical alternatives has also revealed interesting results, which could be of potential benefit to Ratnagiri Project as well as future projects of similar type.

It was found that large size trawlers are more efficient than the 15 tonne trawlers of the project, though there are several qualifications to this conclusion (low, reliability of data for the larger trawler, inability to account for all the social costs, higher investment costs which may restrict the participation of small fishing house holds, and the requirements of larger bathing facilities for large trawlers). Nevertheless this alternative is worth exploring for future fisheries projects. The analysis demonstrated that India would gain by building a larger freezing plant at Ratnagiri to process prawns caught at Malwan rather than freeze these prawns in a low capacity plant located at Malwan. Postponment of the project would not be desirable since the NPV falls with postponement. On the other hand the early completion of the project improves the projects social profitability. Private profitability measured by a "financial rate of return" and a " cost flow statement" is also positive but less so, than the projects social profitability.

The results of sensivity analysis reveal that the projects social profitability is sensitive with respect

to three variables. The projected export price for frozen prawns the accounting price of foreign exchange and the average annual prawn cath per trawler. The last variable is most sensitive.

The above references deal with general economic analysis. The following review refers to books and papers applying the technique to housing.

Pama et al [8] have edited a volume containing important papers on low income housing. The book gives a good surety of alternative policies and programmes. Calderwood [9] while discussing principles of mass housing has also considered the problem of rent determination. National Buildings Organisation [10] have compiled selected papers on housing finance. Smith\Wallace [11] deals mainly with the roll of private sector on housing. HUDCO programmes policies and guide lines are discussed in their publication[12] Symposium on changing concepts of Human habitation [13] also provides useful information. Fourth session of the United Nations Commission as Human settlements [14] and Census of India Housing reports [15] also provide useful information.
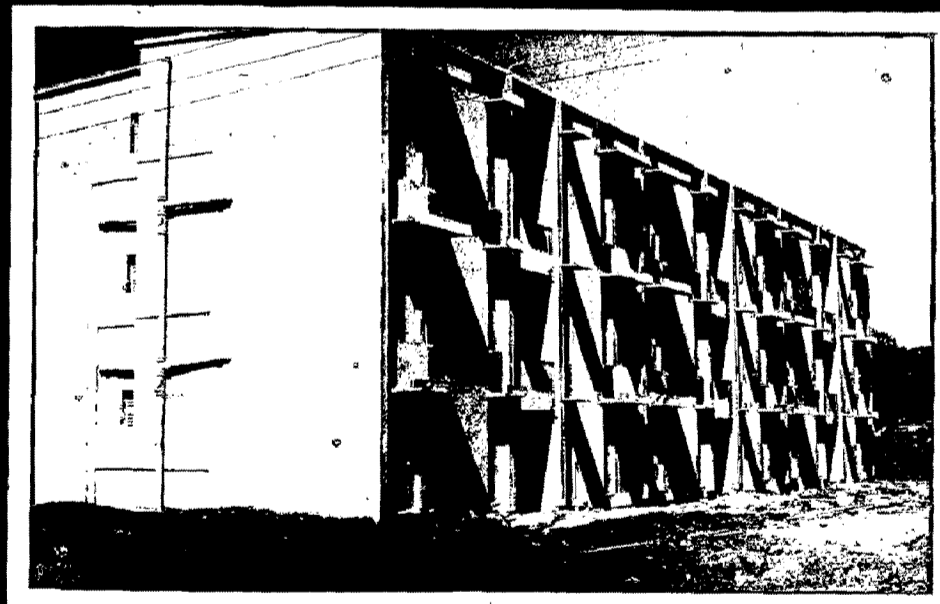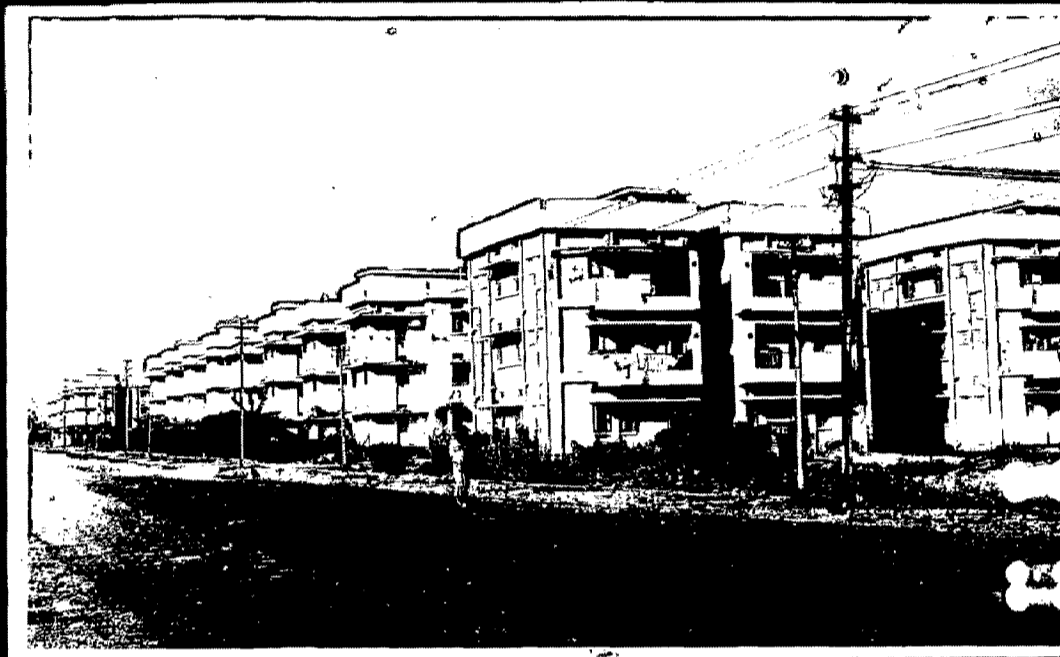
PUBLIC HOUSING

CHAPTER II

THE HOUSING SECTOR

2.1 INTRODUCTION:

A significant aspect of planning models adopted by the country since 1947 was the national importance given to construction activities especially rural and urban housing. This realization led to increase in the capacities of various building materials industries as also establishment of new industries.

A number of technical universities and research institutions were simultaneously started to train the various technologists and conduct research. Since then construction industry has been steadily progressing although its contribution in physical development of human settlements has not been keeping pace with the rising need and expectations of the masses. Being aware of our back-log in the field of mass housing and related infrastructional facilities and socio- economic constraints, the response of the construction industry is an admixture of industrialised building prefabrcation and traditional technologies. Broadly speaking for our urban settlement, we are simultaneously working on the total spectrum, i.e. from using the conventional on site construction and mechanised assembly.

The construction industry is involved in almost all sectors of human activity.

2.2 CONSTRUCTION INDUSTRY AND EMPLOYMENT

According to 1971 census, about 1.2 percent of the total labour force in India was then engaged in the construction industry. Table 3.0 shows the residential pattern of this labour force, according to which only 50% of construction workers actually lived in urban settlements while possibly a substantial number commuted daily between their villages and the construction project site. The number does not include workers in the unorganised sector and petty trades.

Table 3.0

Labour force in 1971 in millions

Labour force	In rural areas	In urban areas	Total
Total No. of workers in the country	148.0	32.0	180.0
Workers in the construction industry (including Dams, bridges roads etc.)	1.1	1.1	2.2
Workers in building industry alone	0.6	0.0	1.4

The role of construction industry as an employment generator is significant as seen from table 3. It must be mentioned that a large amount of construction work is done in the informal (not so well enumerated) sector on the fringes of the monetary economy. This includes construction involving self help or paid labour and using a wide

a wide variety of techniques and high percentage of local materials.

As is quite evident from the table 4.above, the capacity of one million rupees to employ skilled and un-skilled building workers has been steadily decreasing over the years. This holds good for the directly employed labours as well as for labour which is indirectly employed in materials production and supporting industries. Reasons

Table - 4.2

Employment potential for Rs.1 million building industry.

		1961	1971	1975
1.	Direct	250	126	1875
1.1	Skilled and unskilled labour			
1.2	Supervisory (Technical)	9	6	4
1.3	Supervisory(non Tech.)	11	7	5
2.	Indirect employment in building materials and supporting industries	400 670	200 339	140 236

for this are many and include the rate of inflation and infrastructure agriculture industry of technology, fiscal policies and incentives etc. About 2/3rd of the investment in building field goes towards payment of wages to personnel

engaged in the building materials productions and
direct construction activity etc. The employment potential
of building industry on the basis of jobs it provides for
housing construction is equally important. Table 4.1 below
shows the employment capability in direct and indirect
activities related to building industry ; Employment
(in millions) in building industry at a construction rate
of one million dwelling units per year.

Table 4.1

1. Direct employment		
1.1 Skilled labour		0.3
1.2 Unskilled labour		2.2
1.3 Supervisory (Tech.)		0.1
1.4 Supervisory (Non-Tech.)		0.1
2. Indirect employment (in building materials and supporting industries)		0.5
2.1 Skilled labour		0.5
2.2 Unskilled labour	3.6	
3. Total		6.8

It should be noted here that the above figures
relate only to our present modes of construction. In case,
some alternative technogies are developed and adopted for

housing construction, the figures would change accordingly.
Today since we are constructing only about 0.7 million
dwelling units per year, our building industry in the
formal sector is able to provide gainful employement
to approximately 4.75 million people in the country. A
break up of this figure shows that about 1.75 million
of them are employed directly against 1.4 million in
building industry in 1971. The remaining 3 million are
working in building material production and other allied
industries.

2.3 ORGANISATION OF BUILDING INDUSTRY

The building sector of the Indian construction
industry is not sufficiently organised. The two important
reasons for this situation are (i) that the building
construction,activity, even in large urban settlements,
is widely scattered physically and large scale building
projects are relativelybfew . (ii) that returns on private
investment in this sector are meagre due to complex
organisational problems. Since the building industry
utilizes several types of materials, all three levels of
industries have become involved in this field, for
example- Heavy Industry- producing steel cement coal etc.

Medium scale industry	—	For producing glass A.C. sheets door shutters machine made bricks, sanitory and water supply fittings PVC pipes, ACC spun pipes, stoneware and cast iron pipes door and window fittings, steel windows etc.
Small scale and cottage Industry	—	For production of bricks, lime, timber joinery, steel fabrication, stone ballast and grit, various types of tiles, paints finishes for roofing and flooring.

A part from this there are many petty trades like plumbing, masonry and carpentry organised individually or in small groups which serve these industries.

The building industry is however not picking up fast enough, may be because of the construction industries affinity to conventional modes of investment and construction and high economic stakes. This has also affected the industries ability to contribute to economic development and its share in gross domestic product. In India, the public sector construction agencies play a significant role in the construction industry.

The various departments of central and State Governments
in the field ofpublic works, Irrigation,Transport, Housing
Water Supply and Rural development undertake construction
varying in magnitude from a large dam or a large housing
complex to small hospitals and schools in villages. The
public sector agencies set up for manufacture of steel, heavy
machinery and coal mining often design and construct their
own townships and thus create new settlements like Bhilai,
Bokaro, and Durgapur. The C.P.W.D., designs, constructs
maintains and repairs workse and buildings for most central
Government departments. It has lot of expertise, in the
architectural, structural, landscaping and horticultural
fields apart from Civil construction.The department employs
about 39,000 persons directly apart from labourers employed
on work given out on contract.

2.4 LOW COST HOUSING

The most important role of the building industry
in human settlement is undoubtedly in the field of
housing for the low income group.

Low cost housing is a term used for the agglomeration
of those dwellings wherein the space available the materials
used, the expected life span, and thejavailable services
are just at the minimum acceptable levels consistent with
safety, health and affordability. Unfortunately low cost
housing is in danger of becoming either a sop for the public
sectors inÐability to help people build houses that they can.

Table -6

	Urban	Rural	Total
Excellent	17.3	6.6	8.9
Farly good	63.3	66.0	65.5
Bad and dilapidated	18.4	27.4	25.0

from Table 6

It is clear that nearly one fourth of our current housing stock is in bad and dilapedated condition and out of the rest, 65% requires improvement. Coupled with this are formations of new house holds each year who also need to be accomodated in good houses.

2.5 THE LOW INCOME HOUSING DELIVERY SYSTEM

There several different systems by which lowincome people acquire a house. Understanding the housing situation in India requires an investigation of the system of arrangements that low income people make for obtaining adequate shelter for themselves. This system ranges over the entire realm of social and economic institutions and agreements, for beyond the limited concern of the Government housing agencies with the construction oflow cost housing units, or with incentives to the private construction sector to inspire them to build cheaply. It is a system of arrangements

THE EXISTING LOW-INCOME HOUSING DELIVERY SYSTEM

- The Low Income Housing Delivery System
  - The Squatters Housing Subsystem
    - Pure Squatter Settlements
    - New Squatters
    - Abandoned Buildings
    - Floating Squatters
    - Structures on Expropriated land
      - Seasonal
        - Structures
        - Boat Houses
      - Pavement Dwellers
        - Open Air
        - Sheltered
  - The Temporary Land Tenure Subsystem
    - Land Rental
    - Free Land
      - Work place
      - Residential
  - The private Housing Subsystem
    - Rental Housing
      - Tenements
      - Houses
        - Single Family
        - Subdivided Houses
      - Single People's Lodgings
    - Owned Housing
      - Gifted Houses
      - Inherited Houses
      - Owner Built Houses
      - Purchased Houses & Flats
    - Free Lodging Surplus
  - The Commuters Housing Subsystem
    - Inter Urban Commuters
    - Rural Commuters
  - The Employees Housing Subsystem
    - Institutional Housing
      - Government Workers Housing
      - Private Organizations
    - Factory Site Dormitories & Barracks
    - Maintenance Staff Quarters
    - Shops & Workshops
    - Construction Site Sheds
  - The Public Construction Subsystem
    - Public Flats & Row Houses
    - Welfare Tenements
    - Transit & Relief Camps
    - Hire Purchase Single Houses
  - The Public Assistance Subsystem
    - Squatters Assistance
      - Squatter Improvement
        - Land Subdivision
        - Neighbourhood Amenities
        - Construction Loans
      - Squatter Resettlement
        - Sites & Services
      - Temporary Sites
        - Core Housing
    - Assistance to Private Housing
      - Assistance to Rental Housing
        - Neighbourhood Amenities
        - Transfer of Ownership Scheme
        - Structural Repairs
        - Quarters Allowance
      - Assistance to Owned Housing
        - Neighbourhood Amenities
        - Aided Self Help Houses
        - Rental of Abandoned Properties by Government
        - Loans to buy Apartments Row Houses
        - House Construction Loans

THE EXISTING LOW-INCOME HOUSING DELIVERY SYSTEM

between people, lowincome people on the one hand, and many other people that have access to housing resources, whether they be land, finance, materials, permits, contracts or simply information. Understanding the workings of the complex system simplifies considerably the vast housing task confronting the Indian Government today.

A study on low income housing arrangements has revealed a large number of housing types, the final classification is depicted in figure-3.

Seven different sub systems were identified. These are the sqatter housing subs-system, the temporary Land revenue Subsystem, the Private Housing sybsystem, the commuter Housing Subsystem, the public Construction sybsystem and the public Assistance, subsystem.

The squatters Housing sub-system communities belonging to this subsystem are located on land parcels over which the people have no legal rights, and generally pay no rent. Housing units are therefore considered to be illegal structures and are usually not counted as a part of the housing stock. The majority of the squatters build structures of a temporary or semi permanent nature, while some build no structure at all.

There are five major types of arrangement for obtaining housing under this subsystem. Pure sqatters; Mini

Sqatters; Abondoned buildings; Floating Squatters; and structures on expropriated land. The Floating Squatters can be further divided into four subtypes, as we shall be explainedbelow.

Pure squatter settlements are formed by squatters who group themselves to form communities .These settlements usually appear on vacant and unused public and private land or along public right of way Roads, railway,   rivers, canals and electrics power lines. They are also found on slopes of hills, areas subject to flooding, along the beaches and in areas without vehiculer access.

Mini Squatters— are those who set up independent and isolated dwelling units which do not form communities or settlements. They are found living in areas accupied by other land uses, usually on unuseable small plots of land MininSquatters are found in high in middle income areas. Squatters were also found in Abandoned Buildings. These are old uncompleted or damaged structures which are conside red as uninhabitable, but which can be used by squatters. Floating — Squatters are those which do not occupy fixed location in the city. They are of two types: seasonal Squatters and Pavement Dwellers. Seasonal structures are built by squatters which are purely temporary and appear in particular seasons, following climatic, agriculturally based cycles. Boat Houses berthed along rivers and canals are used for residential purposes.

There are two types of Pavement Dwellers, who are
also squatters, although their housing is of the most
informal quality if it is to be considered housing at all.
The open Air Pavement Dwellers are those who sleep on
pavements and do not have structure to shelter them.
Sheltered Pavement Dwellers usually build temporary structures
which can be assembled as dismanteled within a very short
time, whikb some live under sheltered or cantilivered
part of permanant structures. Most sheltered pavement
dwellers can be found in public buildings such as transport
terminals, shopping ~~autres~~ arcades and building edges alongmääo
minor roads.

A final type of pure squatter arrangement is that
in which people live in structures on Expropriated Land.
These people are awaiting eviction from their previously
owned land, which has been appropriated by government for
development projects.

The temporary Land Tenure Subsystem Dwelling units
in this subsystem are owned by, rented or provided free to
present occupants. In this subsystem bath land and the
house are owned by private individuals, with no governmental
or institutional involvement.

The Private Housing Subsystem consults of Rental
Housing, owned Housing, and Free Lodging, surplus system. The
Rental housing is further divided , into Rental Tenements,
Rental Houses and single peoples lodgings. Rental houses are
found in two forms, single Family Houses and Subdivided

employers to their respective low/income employees either free of charge or at a nominal rent which is deducted from their salaries and wages. The term of tenure in this housing subsystem usually ends with the termination of employement.

Government Workers Housing is provided by government or semi government Institutions to their low income employees either free or at nominal rent. Private Organisations Housing is similar to the government type and offers housing solutions to low income workers in the private sector. Factory Site Darmitories and Barracks are constructed by the factory owners for their low income workers within or near the factory premises. The housing unitsare usually in the form of dormitories and barracks, which are essentially raw houses subdivided into a number of cubicles each occupied by a single family. These units are provided free of charge and available mainly in industrial area.

Maintenance Staff Quarters are accomodations provided by employers to their maintenance staff, such as domestic servants, guards,drivers, cleaners and gardners who stay at the work place or at the employers residence.

Shops and Work shops- also provide accomodations as free of charge . In this type/the workers are living in shops and workshops where they usually work. This type is predominant in commercial and industrial areas specially in

hotels, restaurants, small shops and repairing shops.

Surplus houses of charitable private owners which are given free of charge for use by low income people are called Free Lodging Surplus: The occupants in this type do not squat, own, or pay rent, nor are they employees of the houses.

The Commuters Housing Subsystem

Commuters are those people who travel regularly to their work place in the city from areas outside the city. The commuters obtain their housing at their place of origin and try to compensate for their higher travel costs by lower housing expenditure. There are two types of commuters identified in this study. Inter urban commuters and Rural commuters.

The Public construction subsystem - This system consists of housing units built by government agencies for low income people. This is a government effort to alleviate the low income housing problem. The dwelling units are either sold or rented to the people usually at subsidized rates. There are four types of housing available in this subsystem. Public Flats and Raw Houses, Welfare Tenements: Transit and relief camp; the Hire purchase Single Houses.

Public Flats and Row Houses- one constructed by
government or semi government agencies in the form of
flats or row houses, some of which are multi storey
buildings . The Public Flats and Row Houses are permanent
structures which are partitioned into apartment units,
each of which is occupied by a single family. They are
found in planned residential zones, and are available
in all the six cities in the study.

Welfare Tenements- are free or highly subsidized
dwellings provided by the government as part of its social
welfare scheme.

Transit and Relief Camps are temporary accomodations
provided by government for displaced persons. Transit
Camps are dwelling units for lowincome people who cannot
be permanently settled immediately. Relief camp are those
units provided to people rendered houseless by disasters,
natural calamities, and way . The transit camps are permanent
structures whereas the relief camps are temporary or make
shift buildings Hire Purchase Single Houses are dwelling
units constructed by the government for sale to low income
people , on an instalment basis.

Housing units in Public construction subsysteme are
essentially located in residential zones especially in
planned communities . In some cases they are also found
in suburbs,

The Public Assistance Subsystem- This subsystem
is one in which the government and the people through
joint effort try to solve housing problems. These housing
solutions are based on the improvement of existing housing
units or on the creation of appartunities for people to
build their own houses. It naturally, encompasses, therefore,
the provision and improvement of amenities and services.

This subsystem can be divided into two main forms
of public assistance, squatters Assistance and Assistance
to Private Housing. The former can be divided into three
categories: Squatter Improvement; Squatter Resettlement
and Tour party Sites. Squatter Improvement further sub-
divides into land Subdivision,Neighbourhood Amenities and
Construction loans, while Squatter Resettlement subdivided
into sites and services and Core Housing.

Assistance to Private Housing can be divided into
two categories. Assistance to Rental Housing and assistance
to owned Housing. Assistance to Rental Housing is subdivided
into four types; Neighbourhood Amenities; Transfer of
ownership Scheme; Structural repairs; and Quarters
Allowances. Finally assistance to owned Housing is sub-
divided into five types : Neighbourhood amenities; Aided
Self Help Houses; Rental of abandoned properties by Govern-
ment Loans to buy Apartments and Row Houses; and House

Construction Loans.

Under Squatter Improvement Land Subdivision results when the land which is at present illegally occupied by squatters is subdivided into smaller parcels and told to occupants. This type is found in ~~Manila~~ *India* only. Neighbourhood Amenities in Squatter improvement, which include provision of basic infrastructure such as water, electricity, roads and walkways, sewage and garbage collection are provided to improved the condition of squatters.

Construction Loans are provided by government agencies to squatters to build their houses. Under squatter Resettlement the Site and Services type is that in which the government develops land by providing infrastructure, and allocates it to former squatters for resettlement. On the developed plots the settlers build their own structures. Most of the people benffitting from these schemes are former squatters who are evicted from other location in the city. In Structural Repair programmes old rental houses and tenements are renovated by the government.

Under Assistance to Owned Housing, Neighbourhood Amenities are provided by public agencies to the houses owned by low income people . In the Aided Self Help Houses type, the government provides the land, construction

materials and technical know how while labour is provided
by the people themselves. This assistance is provided at
the Community level. Loans to Buy Apartments and Row Houses
are provided to the low income individuals by the government
or state owned banks. House Construction Loans are provided
to the low income people by the government or commercial
banks on favourable terms to build or repair dwelling
units. Loans are available to individuals or groups of
people.

This study gives a brief out line of the richness ~~rediness~~
and complexity of the low income housing delivery systems.
Given a better understanding of the requirements and
constraints of each type of arrangement, it may be
possible to decide on better allocation of limited housing
resources.

and Dock Labour in the centre (Note:- Unit cost in brackets reprewent average ceiling cost of HUDCO.

Table -8

Investment and Physical Target in Social Housing 1980-85

Scheme	Unit cost Rs	Investment envisaged plans-HUDCO Rs. in crores		Targets (in lakh dwelling units/sites)		
		Plan	HUDCO	Plan	HUDCO	TOTAL
A. SOCIAL HOUSING						
1. EWS Housing (upto Rs. 350 PM)	3000 (6000)	485.70	180.00	16.19	3.00	19.19
2. LIG (351-600PM)	15000 (15000)	97.10	150.00	0.64	1.00	1.64
3. MIG (Rs. 601-1500 PM)	25000 (33500)	51.80	150.00	0.20	0.45	0.65
4. HIG (above Rs. 1500 PM)	40,000 80,000	12.95	120.00	,0.03	0.13	0.18
5. Rural Housing	500	183.50	-	36.70	-	36.70
Total A		831.03	600.00	53.76	4.60	58.35
B Rural House Sites	250	170.00	-	68.00	-	68.00
C Apartmental Housing	35000	246.00	-	0.70	-	0.70

To arrest the growth of slums in the ᵘʳruban areas, the main emphasis in the sixth plan is on the promotion of environmental improvement and on housing of economically weaker section. The strategy here is to provide sites and service with enough funds for a core/structure, beneficieries being given loans upto Rs. 3000 per unit repayable over a

materials and technical know how while labour is provided
by the people themselves. This assistance is provided at
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constraints of each type of arrangement, it may be
possible to decide on better allocation of limited housing
resources.

CHAPTER - III

HOUSING-FINANCE AND HEALTH ASPECTS

3.1 PUBLIC HOUSING:

The expenditure under the five Year Plan on
public housing increased from Rs. 480 million in the
First Plan to Rs. 14908 million in the Sixth Plan 1970-85,
The details of investment in housing for different plan
periods are as follows:

Table - 7

Plan	Rupees in millions
First Plan	480
Second Plan	800
Third Plan	1100
Fourth Plan	1410
Fifth Plan	6000
Sixth Plan	14908

Major part of the public sector out lay is on
social housing schemes which receive institutional
finance also. The aggregate investment in such schemes
and the physical targets are indicated in the table 8
below.

Includes provision for rural housing also.

a) Includes Rs. 637.35 crores of social housing in the
states sector and Rs. 10.2 crores on account of plantation

and Dock Labour in the centre (Note:- Unit cost in
brackets represent average ceiling cost of HUDCO.

Table -8

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4. HIG (above Rs. 1500 PM)	40,000 80,000	12.95	120.00	,0.03	0.13	0.18
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To arrest the growth of slums in the ruban areas, the
main emphasis in the sixth plan is on the promotion of
environmental improvement and on housing of economically
weaker section. The strategy here is to provide sites and
service with enough funds for a core structure, beneficieries
being given loans upto Rs. 3000 per unit repayable over a

period of 20 to 25 years at concessional rates of

interest. The scheme envisages that the beneficiaries

being given loans upto Rs. 3000per unit repayable over

a period of 20 to 25 years at concessional rate of interests.

The scheme envisages that the benificiaries will

themselves gradually improve the quality of accommodation

in the course of time. It is realised that the public

sector, has only a marginal, though promotional, rol

play in the provision of urban housing. Given th

resource constraints and more pressing and

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HUDCO has been functioning

ndertake, housing, urban develop-

ment and building material schemes. The main sources of
finance for HUDCO are equally, contribution by the Government,
borrowings from LIC and GIC, and floating of debentures.
By the end of december 1980 it has a total resource of the
order of Rs. 2551 million. It had sanctioned in the same
period loans to the extent of Rs. 6694 million for 1391 housing
and building materials schemes in 339 loans in 17 states, 4
union territories and several rural areas. Under these
schemes, 7,41,173 residential dwellings, 5 4698 non
residents buildings, 1,39,673 residential plots and 3336
non residential plots will be developed. Of these 36
percent of the dwellings and 76 percent of the plots are
for families earning less than Rs. 600 per month. The
HUDCO is allocating 55 percent of its loans for EWS and
low income groups. It is charging concessional rates of
interest of 5 percent and 7 percent respectively for the
above two categories with a respective repayment period
of 20 years and 15 years. The cost of ceilings for the
various income categories have been fixed with reference to be
affordability of the benefit ciaries and maximum proportion of
monthly income which can be devoted for housing. The HUDCO has
started financing rural housing schemes from 1977-78 and is providi

period of 20 to 25 years at concessional rates of
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a period of 20 to 25 years at concessional rate of interests.
The scheme envisages that the benificiaries will
themselves gradually improve the quality of accommodation
in the course of time. It is realised that the public
sector, has only a marginal, though promotional, role to
play in the provision of urban housing. Given the overall
resource constraints and more pressing and competing
clasims on public resources, the vast majority of additional
housing in urban areas will have to be met by private
resources. The role of public sector is supposed to be
restricted to the improvement of slums, direct provision
of housing to some of the urban poor and encouragement
of agences like Housing and urban development corporation
(HUDCO) which can promote the marshalling of private
resources into housing in a contructive manner. In the
field of rural housing the minimum. Needs programme under
the sixth Five year plan places a high priority on the
provision of house sites and assistance of construction
of houses for the rural landless workers.

Provision is being made of Rs. 250/- per family
for developed ﾉplots,and construction assistance of

Rs. 500/- per family, for developed, the target group being
the landless workers membering about 14-15 million.
It is recognised that with this kind of assistance,
the houses will have to be built with only and mud walls
and tiled roofs, but the programme will at least
provide a minimum shelter to the rural landless
workers. It is proposed that organisations are set
up at the local level for disbursement of assistance
in the form of cash or materials and to assist the
beneficiaries in developing layout and housing plans for
a cluster of houses such that proper access as
well as drainage including Latrines is available for
these sites. Attempt would be made to obtain all
materials such as tiles from local parties.

The public sector investment under the state plans
is being supplimented by loans made available by the life
Insurance corporation (LIC), HUDCO and General Insurance
Corporation of India (GIC), and to a limited extent from
commercial banks. The LICs total corstruction to housing
development by way of loans upto 31st March, 1980 ammounted
to Rs.10,285 million given to the state Governments co-
operative housing finance societies, HUDCO and indivi-
duals. The GIC allocated Rs. 140 million to various states
during 1978 - 79 for the implimentation of villages housing
and EWS housing schemes. The HUDCO has been functioning
from 1971 to finance and a undertake, housing, urban develop-

ment and building material schemes. The main sources of
finance for HUDCO are equally, contribution by the Government,
borrowings from LIC and GIC, and floating of debentures.
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monthly income which can be devoted for housing. The HUDCO has
started financing rural housing schemes from 1977-78 and is providin

funds to state agencies for housing projects in rural
areas for low income families provided that the total
cost of a house does not exceed Rs. 4000. HUDCO
has assisted 14 schemes for setting up industries for
manufacturing bricks, wooden components, tiles etc. It has
sanctioned loans amounting to Rs. 566 million to the corpor-
ate employees in the public and private sectors for const-
ruction of houses.

3.2 PROBLEMS OF HOUSING FINANCE AND INVESTMENT

Housing as a problem is not unique to India. There
is hardly any country whether developed or underveloped in
the world today which could justly claimed to have solved
its housing problem. The housing deficit is estimated to
20 million units. (13)

Housing cannot be conceived merely in terms of
houses or dwelling. It has to be conceived together with
the phsycal and techno-economic environment in which the
houses exist. It comprises roads public utilities, like
water supply drainage, sewerage and community facilities
like schools, parks playgrounds and dispensaries etc.
Any such investment in housing in the sense of dwellings
alone is incomplete.

The problem of housing in the poor and economically
less developed countries becomes even more intense because

such countries do not only have ~~services~~ serious housing shortages,
growing additional housing needs and poor housing stocks
but are awfully deficient in essential services and facili-
ties also. A large number out of over (~~260~~ 2960) urban, nothing
to say of rural, areas do not even now have protected water
supply services drainage and sewerage and adequate roads.

It has been estimated that in the capital cost of
a township for 80,000 inhabitants, housing investment
represents only 45% of the total cost of the road
and public utilities alone represent 20 percent.
According to estimates made in Delhi Master Plan, expenditure
on community facilities alone amounts to about 25 percent
of the cost of housing. Thus for every Rs. 1000 spent on
Houses another Rs. 500 or so are needed to make housing
functionally and socially livable of which Rs. 250 or
so will be needed for community facilities alone.

Housing is not a static but a growing problem.
Rapid urbanisation, particularly in those countries
which have just begun to ~~moveee~~ make efforts to move
along the path of economic and industrial development,
implies structural changes in the economy and a drift
of population from the rural to the urban areas. As
this urban ward drift of population gets accentuated it
creates the immediate problem of housing the migrants
in the receiving urban areas. These migrants come
without any money or means in search of jobs which do

not exist or exist for the small fraction of the
total number. They cannot afford any rent at all, at
least in the initial stages of their settlement in the
urban areas. Besides migration the high natural growth
of urban population (2% during 1951-61 in India), the
rate of family formation due to increased geographical
and economic mobility and perhaps partly due to gradual
beaking up of the traditional joint family system add
to the magnitude of the housing problem. Exorbitant
rents, overcrowding, congestion, slums and squatting
are eloquent manifestations of the worsening housing
situation.

INVESTMENT IN HOUSING:

Housing may fall in the category of both
consumption and investment. The quality in its character
as an economic category has an element of inherent
contradiction. As one of the terms of consumers expen-
diture it is governed by the levels of personal or house
hold incomes, employement, and the pattern of income
distribution and savings in a given economy, within
the limited family budget expenditure on housing
for most of the families has to complete with more
essential needs like food and clothing, childrens
education and health.

Considering housing as an investment two
principal agencies making investment in housing may
by distinguished (1) Private owner and (2) Public
authorities of all descriptions. Private investments,
no doubt contribute the major share of total housing
investment in all countries excepting in a few
centrally planned ones. The tenure status of houses
as in 1971 is given below.

Table -9

	Tenure Status	Total No. of census household
India Total	Total	97,056,737
	Owned	82,080,270
	Rented	14,976,467
Rural	Total	77,935,246
	Owned	73,070,545
	Rented	4,864,701
Urban	Total	19,121,491
	Owned	9,009,720
	Rented	10,111,766

From the above table it can be seen that
while in rural areas 94% of the houses are owned in

urban areas more then 50% are rented. Thus it is
obvious that private investment in housing plays major
role in the field of housing. But as mentioned before
25.6% of them are in bad and dilapidated condition.
In addition to this there is a housing shortage of 19.7
million houses.

In private investments it is normal to expect
that these investment decisions will be governed by the
rate of return on the money invested. And this decision
will be greatly influenced by comparative rates of return
in other investment channels in different sectors of
economy like industrial, commercial, banking and financial
If for example industrial shares give 10 to 17 percent
or more return as estimated by a foreign expert on the
basis of reserve bank Survey of 1001 Indian Public Limited
companies, investment in rental housing will not be made
unless income from rents compares favourably with returns
from other possible avenues of investment.

Against the normal expectations of the average
private investor may be set the rent paying capacity of
people. The rent paying capacity is determined by the
level of personal family income in the case of individuals
and by the pattern of income distribution in the community
at large. India's per capita income was estimated at Rs.350

The range of variation in income distribution is not
precisely known. From 13 of the socio-economic surveys
sponsored by the Research Programmes committee in selected
cities of India it is however, found that about 80 to 90
percent of the families in the cities had a monthly
income less than Rs. 250. Families with less than Rs. 100/-
P.M. were over 50 percent of the families in most
cities. Families with over Rs. 500 P.M. income ranged
from less that 0.5 to less than 5.0 percent except in
Calcutta and Bombay where the respective percentage was
6.8 to 9.6. Assuming 10 to 15 percent of the income
as the reasonable rent paying capacity over 50 percent
families in cities and towns cannot afford more than
Rs. 10 to 15 month rent for their houses. For this mass
of needy humanity even the economic rent at
a minimum one room dwelling, estimated at Rs. 28 per
month by the ministry of works, Housing and supply,
is an almost impossible proposition. In as prosperous
a metropolis as Delhi households paying less than Rs.10/
monthly rent account for 38% of all households.

Under these circumstances it is logical to
infer that no private enterpeneours will feel altruistic
enough to sink money in rental housing for the people
in low and middle income groups who constitute the bulk

of our population. This perhaps explains why luxurious flats, apartments, and bungalow which amortise from exobitant rental incomes the total investment within 7 to 10 years are available in plenty whereas modest dwellings are no where found constructed except by a few owner occupiers, public bodies and industrial concernes. It also follows that it will be futile and chimerical to look at private investment in housing with any measure of hope as far as the housing problem of the masses is concerned.

Turning to the role of the public sector in the field of housing, the ability of the public authorities to make investment in housing or for that matter any investment in the ultimate analysis depends upon the level of country's economic development itself. In countries with low per capita income, low saving margins and low rate of growth the public revenues are grossly inadequate in relation to the multifarious pressing needs awaiting fulfilment.

On the meagre public revenues there are numerous competing demands which include defence, essential projects and programmes including developmental ones. In anxiety to strengthen the economy at the grass root levels,

allocations for houses from within the limited resources
are bound not only to be small but also relegated to a
very low priority. The ratio of the outlay on housing
to total plan out lay has remained as low as 1.7.

This happens because housing investment is chara-
cterised by high capital output ratio, lacks spread
effect on growth potential in the sense of its direct
contribution to further economic growth and is unable
to contribute to foreign exchange earnings.

The limitations of the public sector thus
rule out the only salvation of the problem for the teeming
millions, namely construction of millions of dwelling
units within the short term and subsidizing their cost
of construction or rents to bring them within the reach
of the masses. Both these propositions would prima
facie, appear somewhat fantastic because neither cons-
truction of houses on a scale commensurate with needs
nor the amount of susidies involved there in are any
way feasible.

3.3 DECENT, HOUSING A RIGHT POSTPONED

3.3a   Health and Housing (13)

Though the magnitude of problems in housing
investment seem in surmountable the E.W.S and L.I.G.
also have an equally pressing need for good housing.

'THE WRETCHED OF THE EARTH'

Hundreds of millions of people today live
in dialapidated, detereorated, dangerous housing
accomodations. Studies in different areas of the
world reveal that death rates from a variety of
diseases, pneumonia, influenza, tuberculosis enteric
diseases- are $1\frac{1}{2}$ to 2 times as high in bad housing
as in good facilities. An evaluation of this problem
in New York City documents the validity of these
findings. Bad housing is not only a menance, but it
fails to provide an environment for rest, study,
contemplation, individual work and enrichment of the
spirit, without which man does not survive . The result
is a loss of morale, destruction of life forces and
concomitant lack of interest of life and living. This
is reflected indespair and poverty which compound the
disease problem.

World technology now provides the skills to
prevent this situation and to provide a healthful,
wholesome housing environment for todays people and
generations to come. The costs of ~~earning~~ providing for the sick,
fighting disease, helping the poverty stricken and
overcoming the savages of social decay that accomodate
bad housing, are so great that communities must sacrifice
educational facilities and other valuable community
assests to pay the bad housing bill. Planning and action

by the discipline involved in this problem, will right
this wrong.

Not with standing the extreme difference among
people, of language, culture, temperament, religion,
mode of government, one principle prevails among all
peoples all over the world. Where there is bad housing;
ignorance and poverty, there will always be markedly
increased disease rates and positive evidence of social
decay in the individual, family and group. Studies
of residents of bad housing in urban areas all over the
world demostrate this fact. An analysis of vital statis-
tics of New York City confirms these findings in connect
-treating poor housing and low income groups with disease.
It will be seen from this comparision of areas that the
bad housing areas infant mortality more than twice as
high ; maternal mortality is four times as high; tubercu-
losis mortality incidence are five to six times as high
pheumonia and influenza mortality is twice as high,
illegitimacy is twelve times as prevalent; prematurity
occurs twice as often; the incidence of syphilis is more
than seven times as high and bacillary dysentry occurs
eleven times more frequently. Lead poisoning in children
also is directly associated with slum dwelling. During
1969 there were 532 cases of lead poisoning with 8 deaths

of children in New York City . The children became sick
after eating particles of paint containing lead or
chewing furniture, window sills and other surfaces
which had been covered with lead paint. This very serious
disease which may end in death or permanent brain
damage is available without too much effort.

Another avoidable environmental hazard in the
deteriorated slum dwelling is carbon monoxide poisoning.
Carbon monoxide is generated in the incomplete combustion
of any material containing carbon used for heating or
cooking, such as coal, oil, wood, peat, gas, etc.
When carbon monoxide is generated in an airless or
poorly ventilated room, there is a rapid build up of
this dangerous gas.

The following table shows the home carbon monoxide
deaths from gas appliances from 1951 bthrough 1964.

Table -10

year	Total incidents	Fatal	Non fatal
1951	290	99	385
1952	330	38	173
1953	162	45	221
1954	253	56	226
1955	240	45	357
1956	132	28	218

1957	51	9	105
1958	80	13	142
1959	48	9	88
1960	35	5	65
1961	16	3	61
1962	28	12	67
1963	10	2	34
1964	8	6	9

The reduction noted in the table was accomplished primarily as a result of an intensive educational and appliance inspection programme.

Deteriorated houses with bad structuce design, double walls and floors often provide harborages for rats.

When the homes are not maintained properly and there is food and water available rats will make such harborage their permanent nesting places. Although New York City has an extremely low incidence of rats as a result of years of education effort, coupled with inspection programmes and technical training carried out by the Health Department, there still remain pockets of rats infestation in some of the oldest slum dwellings in the city. Here the problem is to reduce the population

to the absolute minimum and keep it at that rate until the occupants can be relocated, all the rats exterminated and the building demolished. While there is no rat boarne disease in the New York City, infants who have just been fed and not washed properly may be bitten by the rat in his search for food.

Home accidents also have their highest frequency in residence buildings which are poorly designed, badly lighted and constructed and which have been allowed to become hazardous as a result of neglect. Lack of proper maintenance, defective electrical wiring inadequate facilities for collection and storage of garbage and refuse prior to removal from the building and corroded, broken, heating gas lines and other heating and cooking equipment and responsible for many fires in slum buildings.

In the extensive reports correlating housing and health there is general agreement that it is the interplay of bad housing, poverty, ignorance and segregation which is the basic problem. Such factors go hand in hand with malnutrition neglect of symptoms and lack of medical care.

These factors interact to bring about social disturbances in individual and family life which are often nor destructive their disease manifestations or physiological malfunction. Much damages is done to the health and

well being of children by a sense of chronic inferiority
due to consciousness of living in sub-standard dwellings
lack of suitable space even for eating and sleeping ,much
less for the amenities of life will seriously handicap a
childs mental and physical development. The child who
suffers the filth, the dark dank squater , who lives
with his demoralized parents in an atmosphere of
misery and resentment cannot grow upto adulthood with
ready acceptance of the role of a responsible member of
his community. More likely than not he will be a burden
upon his neighbours instead of a creative contributor
to the general good.

Privacy is an essential requirement of healthful
housing. If the need which every human being has for a
refuge from the noise, tension, troubles and frustration
of the outside is not met the individual and society
inevitably pay the price.

Another common fault of bad housing is insufficient
light. In addition to improving efficiency and eye strain
there is the psychological effect of depressiveness in the
gloomy unlit , space. For most people, light is a
necessity not only for efficiently carrying out the tasks
of daily living, but also as a stimulus. The poet writes
joyously of light as if it had a life giving quality of
its own. No man should be deprived of light, a natural

exhilarant , so helpful to the down trodden and so
healing to those in need of cheer.

Conditions in a dilapidated,badly equipped home
make proper natural care and impossibility. This may
cause much unnecessary ill health in infants which may
so handicap the natural learning skills of the child as
to be directly responsible for its backwardness. The
child and the community, now have to pay heavily for this
burden. This will be even further aggravated by the
overcrowding which prevents proper study lack of sleep,
exhaustion, faliure of parental influence and will
inevitably result in a dissolute life in an atmosphere
of despondency and hopelessness.

Many, of course , survive such environments. Too
many accomplish this survival by the aquisition of an
unpenetrability which bars communication- either in or
out. Thebresult - a society of emptiness- of crowds and
faceless individuals. The process of social growth and
enrichment slow up and shrink into stagnation. Individuals
find their life outlets in self destruction and often
destruction of others. Security giving family life with
its intimacies, joys, and its beauty is destroyed.
Instead of growing up with gracious consideration for
one another, such deprived individuals often became

utterly and hopelessly indifferent. The world cannot afford to lose the benefits of family life.

Communities are finding that they are no longer able to meet the financial and service needs which slum dwelling demands. Repeated studies reveal that blighted areas use up almost one half of the total community medical and institutional facilities, and a similar proportion of police, fire, health, and sanitation services. Welfare payments, of course, in the main are the product of slum areas.

Laboratory studies of animals have been made extensively to study the effect of stress and crowding. They indicate development of aggressiveness, sterility and even cannibalism. The effect on human beings crowded into slums could not be very different.

It is becoming increasingly recognized throughout the world that aided self-help can accomplish much in avoiding many of the even greatly destructive effects of bad housing. Many such programmes are in operation. The result is that hundreds of thousands of families are

able to advance physically socially and intellectually despite the handicaps of poor home environment. In the city of New York the Health Department has carried on a variety of such activities with good results. Association between poor housing and health is clearly brought out by selected data of new Yor City given in the following table:

Table - 11 (New York City Data)
Ref. 13

Housing	Districts with poor housing	Districts with good housing
Percent deteriorated or dilapidated	32.3	5.9
Mortality rates(per)		
Infants	39.1	17.1
Maternal	7.3	1.8
Tuberculosis	22.5	4.1
Cancer	206.7	193.8
Diabetes	30.4	17.1
Cardio-vescular, Renal diseases	646.5	554.9
Pneumonia, Influenza	66.2	33.0
Home accidents	15.4	9.6
All other couses	12.8	9.6

3.3b EVERY HUMAN HAS A RIGHT TO A DECENT HOUSE (8)

On 10th December, 1948 the solemn declaration
of the United Nations on the fundamental rights of man,
established in Articles 25" Every person has a right
to an adequate standard of housing, which ensures him
and his family health, welfare and especially food, clothing
housing..... "

The right to housing should be considered, then, on
the same level with the essential rights of subsistence
as are food, clothing, medical attention, rest etc. All of
these are indispensable elements in order that man live in
a worthy manner and at the same time fulfill himself as a
person.

Worthy housing is a fundamental requisite
in order that man form his home where his children are
to grow and take their first steps in community.

From this derives the importance that this right be
recognized and put into practice. It is does not become a
reality many of the citizens of our planet will never become
positive agents in the creation of a better world.

In this respect the government has a primordial task
to give to their peoples the possibility of owning their
own home.

It will recognize that one of the greatest services
a government can render to its people is to give each family
the chance to build its own individual house.

CHAPTER IV
CASE STUDIES

In this chapter three case studies of economic analysis of housing problems have been presented. The first is concerned with impact of design variations with costs. The second illustrates economic and social benefit cost analysis of a low income rental housing project. The third case study deals with a hire-purchase programme for different categories of housing.

CASE STUDY I-A

4.1 COMPARATIVE COST STUDY OF FUTURE EXPANSION OF A GROWING HOUSE[16]

It is very difficult to make a general assessment whether future expansion is economical on the ground floor or on the upper floor. Land and construction costs play an important role in determining the economics of future growth.
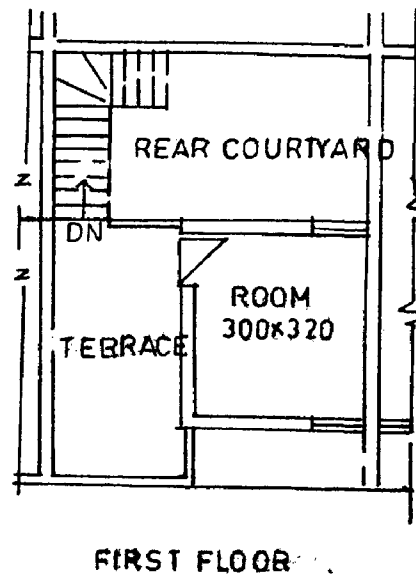
To determine the implications of these aspects and their effect on the overall cost structure of a dwelling unit, a case study[I-A] has been made by developing house designs having the same carpet area and similar specifications at the initial stages and also after making the future expansion for both the alternatives i.e., expansion on ground floor and expansion on first floor. The physical comparison of the two type designs is given in Fig 12 Table 12.

Assuming similar specifications, structural designs and foundations, detailed estimates were prepared for both the type
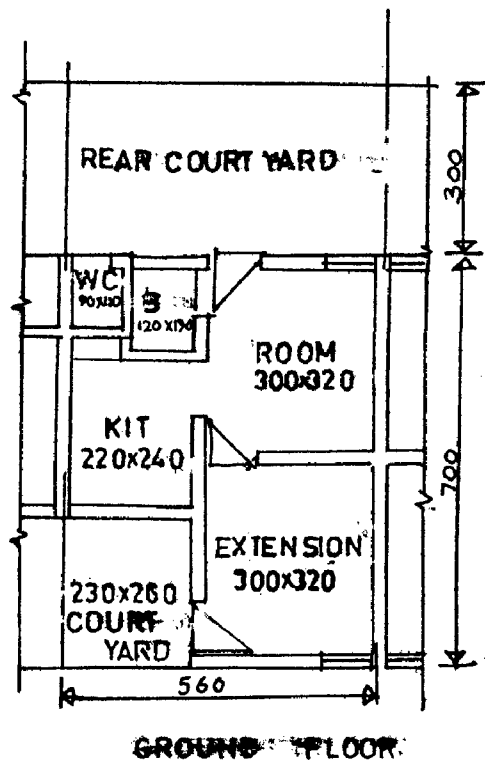
GROUND FLOOR

REAR COURTYARD

W.C 90x90 · BATH 120x150

ROOM 300x320

KIT 220x240

300

440

80

560
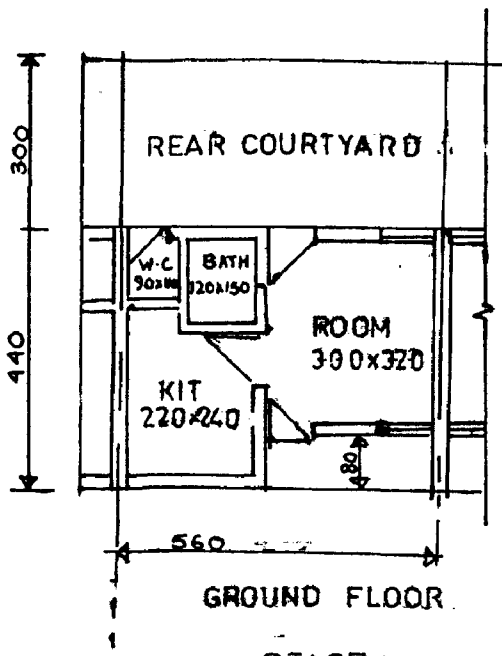
STAGE 1
PLOT SIZE 564 740
PLOT AREA: 41.44 M²
PLINTH AREA: 22.16 M²

FIRST FLOOR

REAR COURTYARD

ROOM 300x320

TERRACE

DN

STAGE-2
VERT DEV
PLINTH AREA
GF+FF: 34.04 M²
EXCLUDING OPEN STAIRS

GROUND FLOOR

REAR COURT YARD

WC 90x90 · B 120x150

ROOM 300x320

KIT 220x240

230x260 COURT YARD

EXTENSION 300x320

300

700

560

STAGE 1+2
PLINTH AREA: 33.22 M²
PLOT SIZE: 560x1000
PLOT AREA: 56 M²

FIG4

designs to assess the additional cost involved for horizontal/
vertical expansion. The cost of additional room on the ground
floor is Rs. 1,950/- while for the vertical expansion, the
cost of adding additional room on the first floor including the
cost of the staircase was Rs. 2,375/-. This indicates that the
expansion of a house on the first floor will have a construction
cost higher by 21.8% when compared to expansion on ground floor.
This higher cost results mainly due to the construction of stair-
case and non-availability of a common wall for the additional of a
room.

COST OF LAND:

Plot sizes for both the type designs were determined
by providing similar areas for the front and rear courtyard
with a concept of row housing in both cases. For single storeyed
construction, 26% more plot area is required to be provided
for the future room. Variations in plot size will lead to
different densities obtainable for each type design. Optimum
densities obtainable for each size plot were estimated. These
are 120 and 150 dwellings per hectare for 56.00 sq.mt.
(Horizontal expansion) and 41.44 sq.mt. (vertical expansion)
plot areas respectively. This results in 26% higher cost per plot
for single storeyed construction.

Total cost per dwelling unit for horizontal and vertical
expansion. Total cost of dwelling unit is the addition of land cost
and construction cost. This indicates that though construction
costs are higher for vertical expansion, these are more than

TABLE 12

COMPARATIVE COST FOR HORIZONTAL vs VERTICAL EXPANSION.

Land cost Ṛ./sq.mt.	Horizontal expansion		Total Ṛ.	Vertical Expansion		Total Ṛ.
	Cost of plot Ṛ.	Opportunity cost Ṛ.		Cost of plot Ṛ.	Addl. cost of cons. Ṛ.	
10.00	560	140	700	415	425	840
15.00	840	210	1050	622	425	1047
20.00	1120	280	1400	830	425	1255
25.00	1400	350	1750	1037	425	1462
30.00	1680	420	2100	1245	425	1670
35.00	1960	490	2450	1450	425	1875

offset by savings obtained in land cost per unit.

In single storeyed construction a lesser density is obtained to the extent of 30 dwellings per hect. Thus an opportunity to accommodate 30 more dwellings per hectare is lost for the privilege of having single storeyed development. This is a loss which will result in additional land cost for constructing these units elsewhere. This additional cost for 30 plots is considered and is distributed equally over the 120 dwelling units obtained in a hectare in case of single storeyed construction. This is termed as opporunity cost in Table 13.

Conclusion of cost study IA:

It is concluded from the study that considering the opportunity cost of land, horizontal expansion of land, horizontal expansion of the dwelling unit in the plotted development is un-economical where the land cost charged to the dwelling units exceeds Rs. 13.00 per sq.mt. of the land allotted to it.

If the opportunity cost is ignored, horizontal expansion in the dwelling unit for plotted development is economical upto a land cost (saleable area) of Rs. 30/- per sq.mt. of the land attached to each dwelling unit.

Any design concept should, therefore aim at vertical growth of the house in a plotted development where the saleable cost of land is more than Rs. 30/- per sq.mt.

TABLE 13

## COMPARATIVE ANALYSIS FOR BUILDING DESIGNS

	Horizontal expansion	Vertical expansion
Plot area	56.00 M^2	41.44 M^2
Built up area (Ist stage)	22.16 M^2	22.16 M^2
Additional area:		
G.F.	11.06 M^2	-
FF(Excl.staircase)	-	-
Total in 2nd stage	33.22 M^2	34.04 M^2
Carpet area	27.27 M^2	27.27 M^2
Stair case area (open to sky)	-	3.70 M^2
Cost of Addition of a room	Rs. 1950/-	Rs. 2375/-
Density available with this design	120 D.U./Hec.	150 D.U./Hec.

GROUND FLOOR PLAN · FIRST FLOOR PLAN
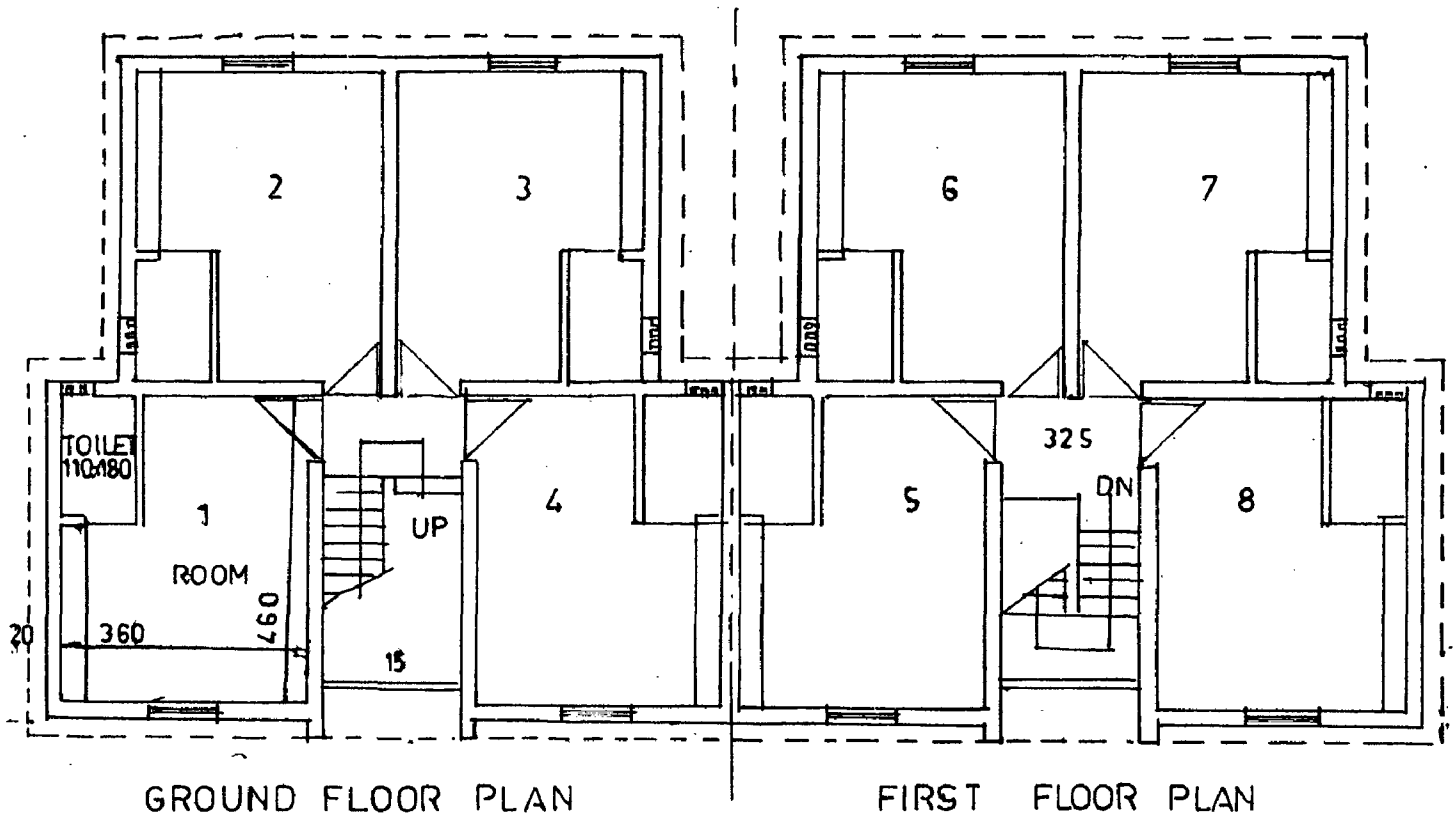
PLAN FOR LIG TENEMENTS

FIG 5

FIG 6
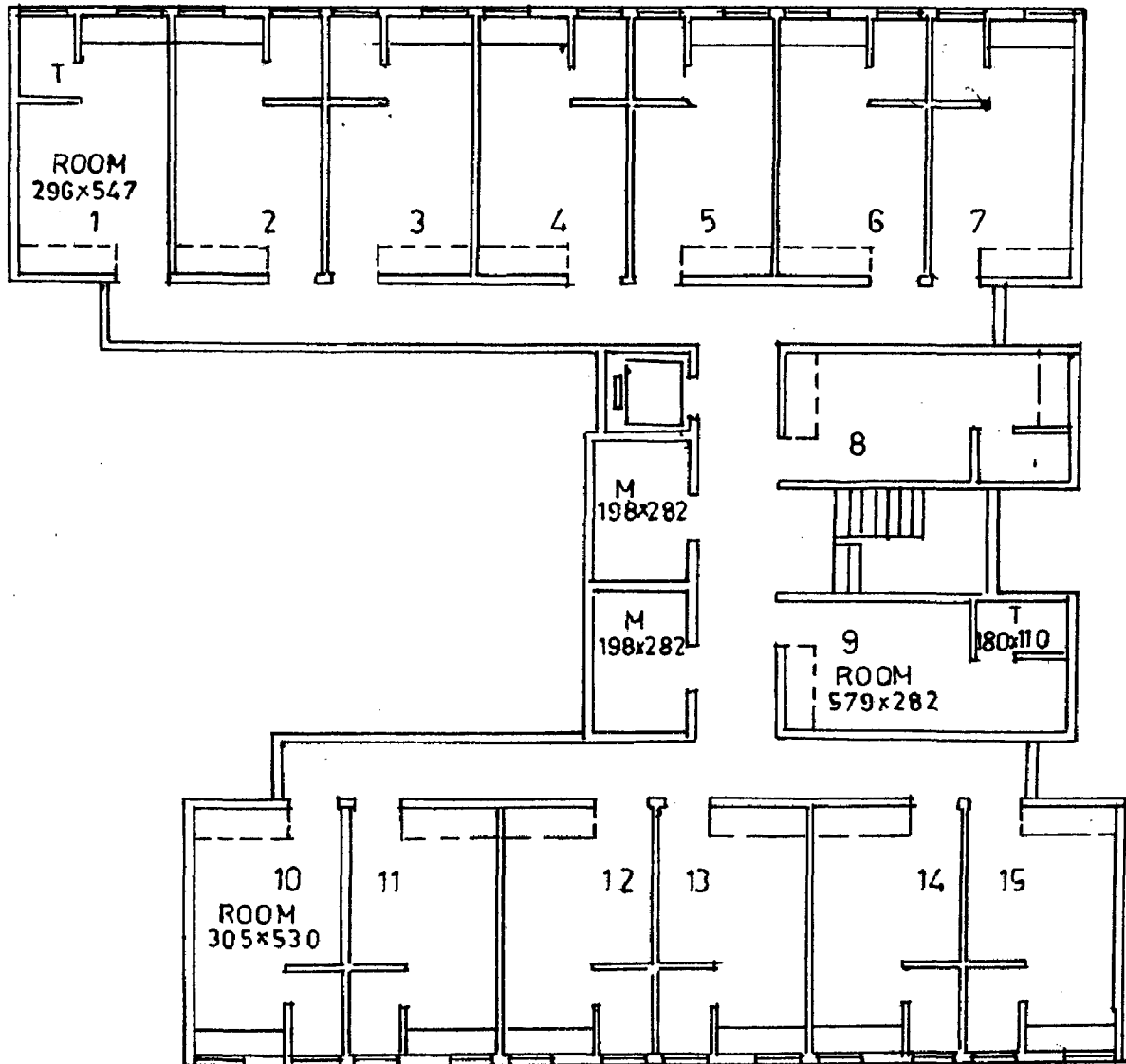
PLAN WITH COMMON CORRIDOR ACCESS

Case study I-O-comparative cost study of corridor access vs
staircase (17)

CASE STUDY :

4.2   In storeyed construction, the staircase is a major
item of expenditure. It is, therefore, generally believed that
economy can be achieved if a single staircase is provided to
give access to as many dwelling units as possible by providing
an internal or external access corridor. Thus many a plans are
produced where 8 to 16 dwelling units are given access by an
external or central corridor served by a single staircase.

There are certain obvious disadvantages of this
system. Firstly, it means long corridors which are not protected
from the elements (sun, rain, etc.) if these are on the
external surfaces of the building. They also encroach upon the
privacy of all the dwelling units except the end one, since
every one has to pass along all the dwelling units. As a result
windows provided on this side of the dwelling unit, tend to
remain closed thus stopping cross ventilation. In case of central
corridor, though protected from the elements of nature, these
tend to be dark, damp and a source of noise pollution. Central
corridors also make it difficult to provide cross-ventilation
to the dwelling units.

Though these facts are recognised by planners,
Architects and Engineers alike, the recourse to such planning
is taken mainly on the grounds of economy in the use of a

..nder circulation per unit and consequently in the share
of cost of staircase per unit.

In order to determine the credibility of this
generally accepted theory that the common corridors with a
single staircase leads to economy in cost of construction,
a case study based on a building design providing single
room tenements in a six storeyed block has been prepared
15 dwelling units are grouped on each floor and are approached
through a 1.22 mt. wide passage served by one staircase. The
design has actually been constructed in Bombay by a Government
Agency and is meant to house the original occupants of the
building which was demolished due to obsolescence.

An alternative plan was developed based on the
requirements as already provided in the original design but
serving 4 dwelling units on each floor by a single staircase.
In this design each dwelling unit is approached from the
landing of the staircase. The net carpet area in both the
designs was kept same. A comparative analysis of cost was made
based on these two designs. (Figs. 5, 6)

DESIGN AND PLAN: It will be clear from the comparativ
analysis of the plans that for the same carpet area the alter-
native design reduces the plinth area by 11.15%. In spite of pr
viding one staircase for every 4 units, the area under circula-
tion (horizontal and vertical) is reduced by 41.5% as compared
to that of the original design, and there is a marginal saving
in the area under services (toilets etc.)

COST: Additional costs involved in the proposed alternative are given in the table 14.

As the access to 4 dwelling units given by one staircase, the length of the walls in Hudco's design is increased by 14.7%. The cost of three more staircases is added though the cost of the horizontal slabs for the access corridor is reduced.

COST COMPARISON: From a comparative analysis of the costs, it is clear that the additional cost of extra wall length and staircases in the alternative design is more than off set by the savings due to overall reduction in the plinth area of elimination of the access corridors.

CONCLUSION : It is thus clear that it is more economical to provide individual staircase access to dwelling units in a group of four as compared to providing long passages or corridors approaching 10 to 16 units on each floor served by a single staircase. This economy is in money terms only.

Over and above, this design gives unquanitifiable advantages and convenience such as privacy to each dwelling unit, possibility of providing cross-ventilation to each dwelling unit, avoiding noise pollution and misuse of corridors and protection from elements of nature.

TABLE 14

	Corridor access with common staircase (Each dwelling unit)	Proposed units of 4 served by one staircase (each dwelling unit)	REMARKS
Plinth area	24.46 $м^2$	21.73 $м^2$	Saving 11.15%
Wall lengths:			
External	9.38 mt	11.42 mt	
Internal	3.64 "	3.64 "	
	13.02 mt	14.94 mt	Extra length by 14.7%
Additional of longer walls	-	Rs. 340.00	
Extra on staircase as compared to PA rate @ Rs. 10/$м^2$	-	Rs. 72.00	
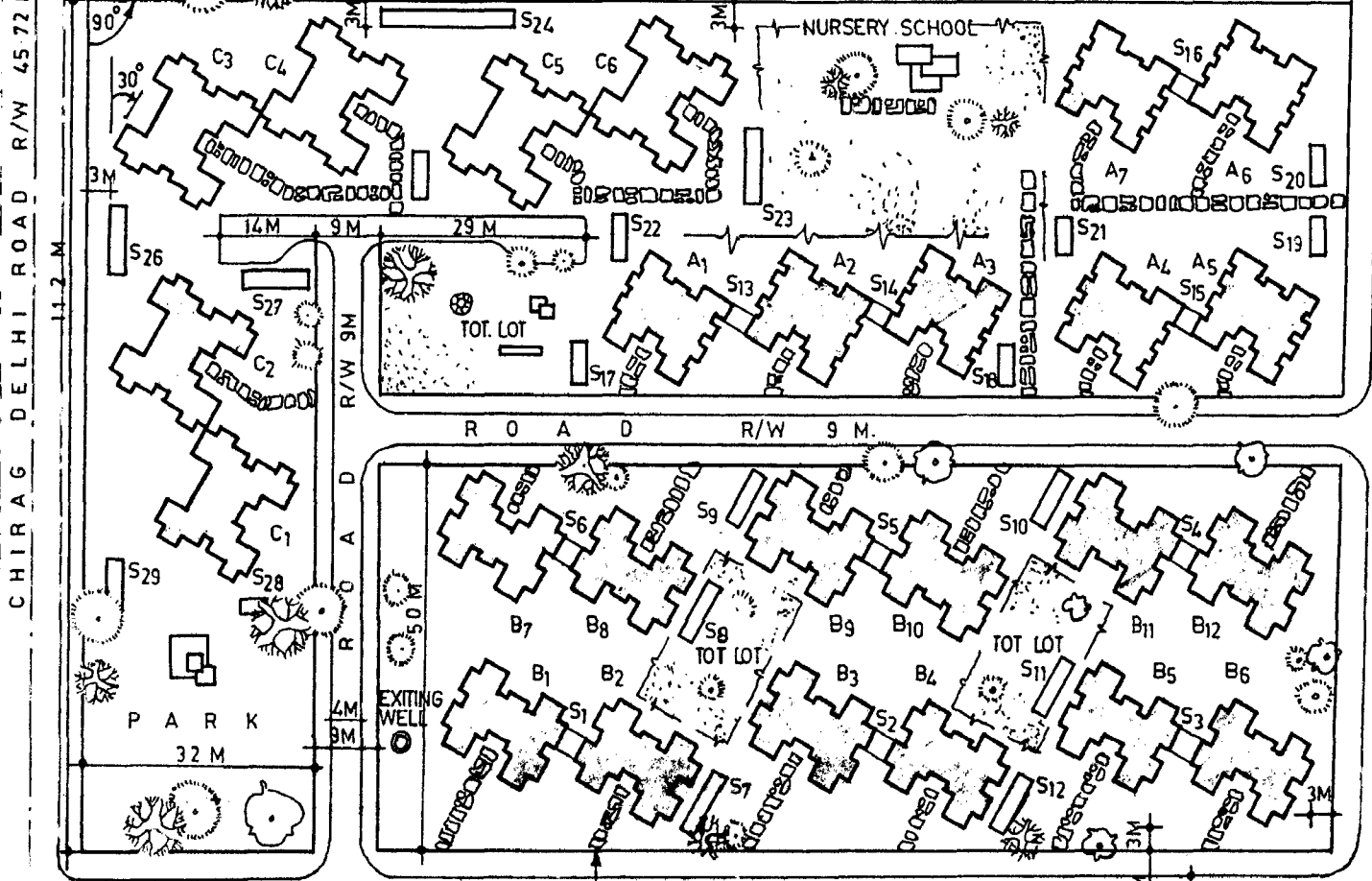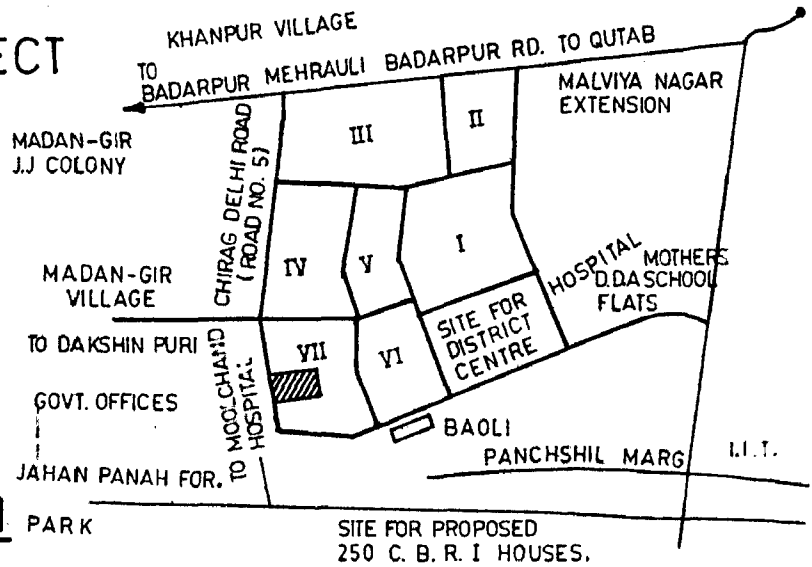
C. P. W. D HOUSING PROJECT

FIG 7

KEY PLAN

CASE STUDY II

4.2 COST BENEFIT ANALYSIS OF A LOW INCOME HOUSING PROJECT(CPWD)

BACK GROUND:

The Union Minister of Works and Housing informed
the press conference in August 1977 that an announcement
had been made by previous Government, in 1972, that 30,000
houses will be constructed for the general pool. However,
previous Government had completed only about 25,00 houses.
It was now proposed to complete 30,000 houses. The work
is still being carried on by the present government. Out of these
200 houses were callotted to CBRI. The houses to be constructed
are of three categories. A type, B type and C type with plingh
area of each type approximately 27.80 m^2, 32.26 m^2 and 39.50 m^2
respectively. The A type and B type houses will be constructed
in two storeyed blocks of 8 houses each and C type to be in four
storey blocks of 16 houses each. (Fig.7) The rates and costs of various
building materials are given in the table.

TABLE 15

Materials	Rate in Rs.	Cost of each category		
		A-27.80m^2	B 32.26m^2	C 39.50m^2
1. sand	32/m^2	Rs. 187.26	Rs. 246.00	Rs. 489.50
2. Bricks	230/1000	3069.25	5309	14985
3. Cement	460/tonne	2360.66	2697.44	3510.26
4. Steel	340/qt.	1953.4	2082.1	4186.4

5. Coarse Aggregate				
a. 20 mm and down	50/m^3	335	390.5	648.5
b. 40 mm and down	45/m^3	128.70	144.00	32.00
6. Brick Aggregate	40/m^3	45.44	56.00	33.60
7. Timber frame sand shutters	2200/m^3	1672.00	1848.00	1980.00
8. Timber shuttering	1700/m^3	238	255	598.40
9. Ballies	8.00/m	120.48	140.16	137.84
10. Lime	60/ql	111.00	130.80	144.60
11. Surkhi	40/m^3	21.6	26.4	15.6
12. Bitumen	32.25/kg	32.25	39.4	49.7
13. Glass	31.5/m^2	31.5	39.9	64.5
14. Primer	28.5/Lt	283	32.85	44.5
15. Paint	71.94/Lt	71.94	82.50	116.38
16. Scaffolding		45.	50	55
17. Labour				
Mason	16/day	1028.96	1127.04	1037.53
Carpenter	16/day	409.28	498.08	1046.08
Painter	15/day	37	43	32
Black smith	15/day	68.7	102	309.75
Mazdoor	8/day	1436	1619.2	1915.00
18. Fittings		392.4	392.4	309.4
Total		10066.72	12032.35	14754.66
Sanitary and water supply 8% of the cost		853.346	962.58	1180.38
Electric installations 7% of the cost		746.67	842.26	1032.84
Water charges 2.5% of the cost		306.67	345.92	424.20

Contractor's profit 10%	1226.7	1393.72	1696.81
Total	13800.5	15566.83	19089.04
Land costs	6000	7000	7000
Grand total	19800.5	22566.83	26209.09

RENTS:

These houses belong to the low income employees whose pay range and rents are given below. The tenants give 10% of their pay as rent while 15% of pay would have been given by the Governments house allowance in the absence of this project. As such in terms of total saving to the Government in taking up this project is taken as 25% of the pay.

Pay range Rs.	Mean say Rs.	Rent 10% + 15% (rounded to nearest Rs. 5)
100-300	200	50
250-500	370	95
500-1000	750	190

ECONOMIC COST BENEFIT ANALYSIS:

As much has been pointed out, housing schemes are a part of State Welfare Programmes. They cannot be judged purely in terms of economic costs and returns. Even so, it is pertinent to analyse the rents charged by the Ministry of

Housing and Works in order to assess their consistency with
the national social and economic policy. The pricing policy
of Housing Boards is as important as the pricing policy in
relation to food grains, clothing and other essential items.
The results might tell us, for instance, whether, the prices
and associated subsidies in housing are properly conceived.
In the light of cost benefit analysis, the Government might
wish to reconsider and restructure its subsidy policies so as
to maximize welfare of the community.

The cost per tenant constructed by HB for low income
groups varies from 19300 to 26089. Data on subsidised rent
charged per tenant and economic rent per tenant have been
computed for each category of tenants.

Economic rent is the annual cost on the investment
based on the prevailing interest rates over the life time
of the house. The appropriate factor to convert an investment
into the equivalent annual cost is designated as the capital
recovery factor and may be computed from the formula

$$i(1+i)^N / (1+i)^N - 1$$

where i represent the interest rate/annum (expressed as a
decimal factor) and N represents the year of estimated life.
i or the social rate of discount has been taken as 10% and
the average life of a house as 75 years. The rate of discount
10% is on the conservative side but is has been taken as
such because this is the maximum interest one can get on
gilt edged securities.

Then any present sum of money is multiplied by the capital recovery factor for N year and at interest rate i the product is the annual figure sufficient to repay exactly the present sum in N years with interest rate i.

Capital recovery factor at interest rate of 10% for a life time of 75 years is

$$C.R. = i(1+0.10)^{75} / (1+0.10)-1$$

$$= 1271.89/1270.89$$

$$= 0.1$$

The economic rents of tenents are given in the Table 3-2

TABLE 16

Categoy	Investment £	No. of Tents	Economic rent £	Subsidised rent/mth.
A	19300	56	168	50
B	22367	96	188	99
C	25039	96	217.40	180

Government Return on Investment (rental) GRR - This is measured by taking the annual subsidised rent per tenent as a percent of cost per tenent. This is the rate of return that the government earns on its rental housing investment. The annual rent is constant over time and the assets life is long. Hence the simple accounting rate of return has been regarded as an adequate measure in present context.

PLANNED RATE OF SUBSIDY (PRS): The difference between the economic rent and subsidised rent per tenent worked out by the

Government is a measure of the subsidy that it has consciously planned to offer to the low income group tenants. Table 4.3 summarises the result of our analysis of the rental scheme.

TABLE 17

Category	Investment	Economic Rent/mths /tenant	GRR Annual rate of return on investment (% based on subsidised rent)	Planned PRS (% rate of subsidised)
A	19300	105	3.03	69.63
B	22567	183	5.05	49.46%
C	25039	217	8.7	12%

The important findings that emerge from the foregoing analysis are as follows:

(1)   The rate of ~~raising~~ return on the Governments investment in low income housing is indeed low except for the highest slab of schemes. This is as it should be since the scheme is meant to help the weaker sections of society.

COST BENEFIT ANALYSIS II USING ACCOUNTING PRICES:

The evaluation of the housing project has been done with respect to the economic returns alone. The project nonetheless contributes to the objectives of health and employment which are also important planning objectives in India. It is necessary therefore to incorporate the contribution of these objectives into this analysis.

In this analyses the following adjustment will have to made.

(1)   Unskilledlabour is surplus and a negative premium
        of 80% will be given to it.
        (Note these premiums have been assumed on the basis
        of general conditions prevailing in the country).

(2)   The accounting prices of steel and cement will have
        to be used as they have a 50% higher opprotunity
        cost than has been used in the initial analysis.

(3)   All taxes on materials like sales tax, excise tax
        will be minimised as they are transfer payments.
        Sales tax is approximately 4% on all materials
        while excise is charged on cement and steel only.

(4)   The social security that will have to be paid due
        to premature deaths amount to D. 14.8, D. 13.02,
        D. 13.02 monthly for the three categories of houses
        A,B,C respectively. This figure has been reached by
        calculating the number of extra death rate which is
        thrice of the death rate of 16/1000, multiplied by
        the social security (which is D. 10,000) and
        divided by the lifetime of the house. These amounts
        will be deducted from the economic rent.

(5)   In general property prices appreciate faster that the
        rate of inflation assuming 5% yearly escalation in real
        terms. the governments rate of return will be the
        rate of return on investment plus 5% increase in the
price of property.
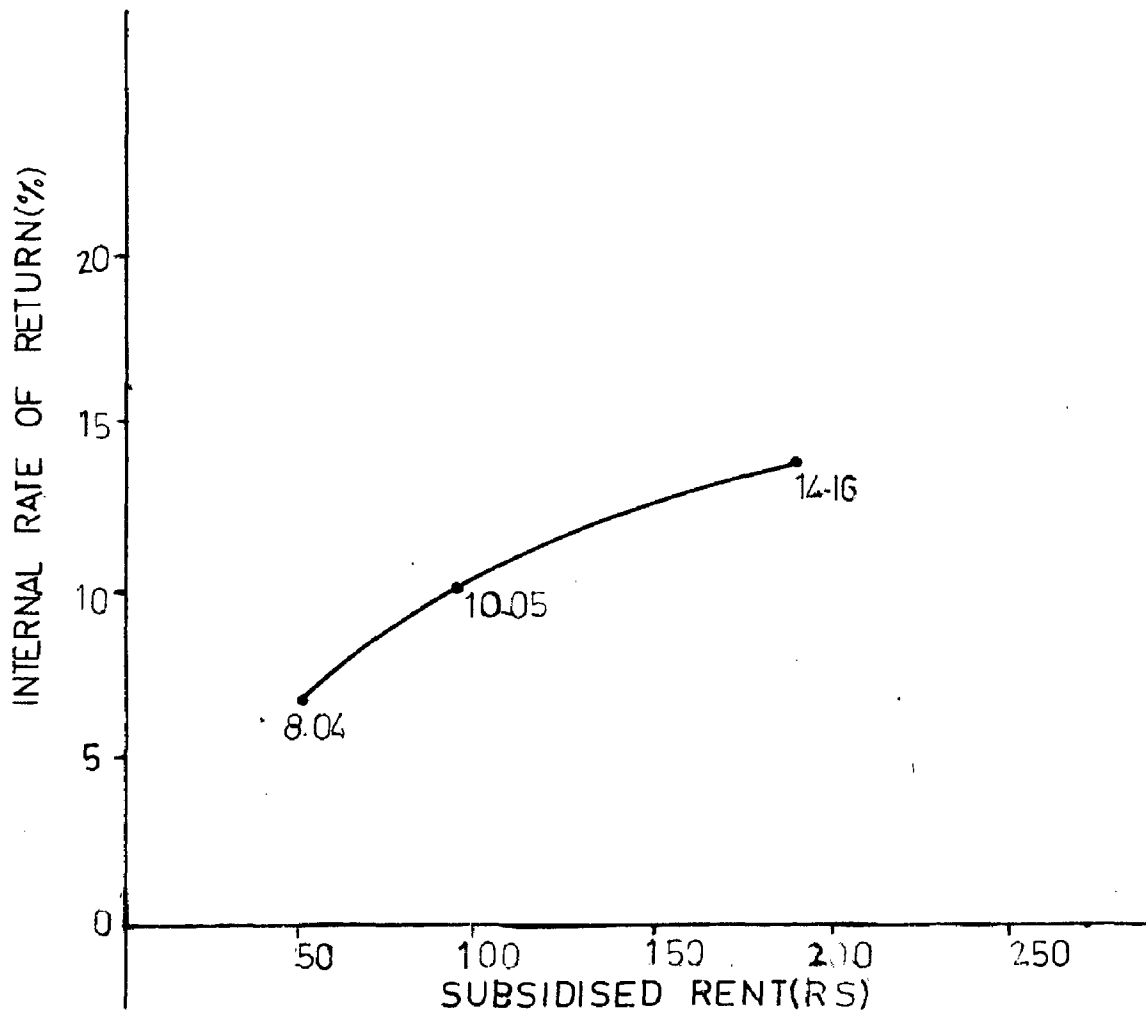
RATE OF RETURN USING SHADOW PRICES

FIG 8

The revised cost and benefits and the resulting IRR and planned rate of subsidy are given in table 18.

TABLE 18

Category	Investment	No. of tenements	Economic rent/ Month	Subsidised rent	PRS (modified)
	Rs.		Rs.	Rs	
A.	19715	56	149.5	80	66%
B.	22562	96	175	95	45%
C.	24871	98	194	90	2%

TABLE 19

Category	Cost	Economic rent/ monthly/ tenant	CRI Annual rate of return on investment (% based on subsidised rent)	cost with 5% annual appreciate on in real terms	P.R.S. Planned rate of subsidy(including appreciation)
1	2	3	4	5	6
A	19715	149.5	3.04	3.04	12%
B	22562	175	5.05	10.05	12.0%
C	24871	194	9.16	14.16	55%

In tables 18 and 19 the first three adjustments have been made in the cost of the house . The change in the cost by using shadow prices of cement, steel and labours is not much as the increase in cost due to higher opportunity cost of cement and

and steel is offset by the decrease in cost due to ~~decrease in cost due to~~ lower opportunity cost of labour and tax reductions

The 4th adjustment, ~~using~~ that of social security has been made in the economic rent as explained earlier.

The 5th adjustment has been made in the governments rate of return for price escalation and the resulting IRR worked out. The results show that ~~which~~ with a 5% annual escalation in prices there is only nominal subsidy of 0.12% in category A, while there is a negative subsidy or net benefit above the economic rent for categories B and C. Thus we may conclude that housing is not such a bad investment for the nation/ and deserves higher priority.

COST BENEFIT ANALYSIS-TWO- REDISTRIBUTION TO LOW INCOME GROUPS:

In this analysis, benefit due to redistribution is evaluated, while price escalation has been omitted.
There are two groups in the low income category who benefit from this project. The first group is of workers employed directly in construction work and indirectly in supporting industries, and the second group is that of tenants for whom the houses are being built.

The direct benefits to workers in the form of wages is D. 16,381. The indirect wages given to workers in supporting industries can be calculated by taking the rate of 376 workers being employed in D. 1 million building industry as given in Table 2 of second chapter. The figures for direct

employment are given below:

TABLE 20

INDIRECT EMPLOYMENT

Category	Cost	No. of Tenents	Total cost	No. employed /million B.	Total No. employed
A	19800	56	1100800	376	417
B	22567	96	2166432	376	812
C	25089	96	2304544	376	940

The wages given at an average of B. 16/ worker amounts to B. 19382.

As weight given to the wages earned by low income group is not known. It is not possible to calculate the social benefit of this income. The feasibility frontier or the social weight attached to the benefits to low income tenents can be derived by giving the benefits to low income tenents three weights of .5 , 1 and 0 and the returns worked out in Tables 4.6, 4.7, 4.8 and 4.9. The range at which the housing project becomes feasible has been plotted in a graph. (fig. 9)

FIG 9
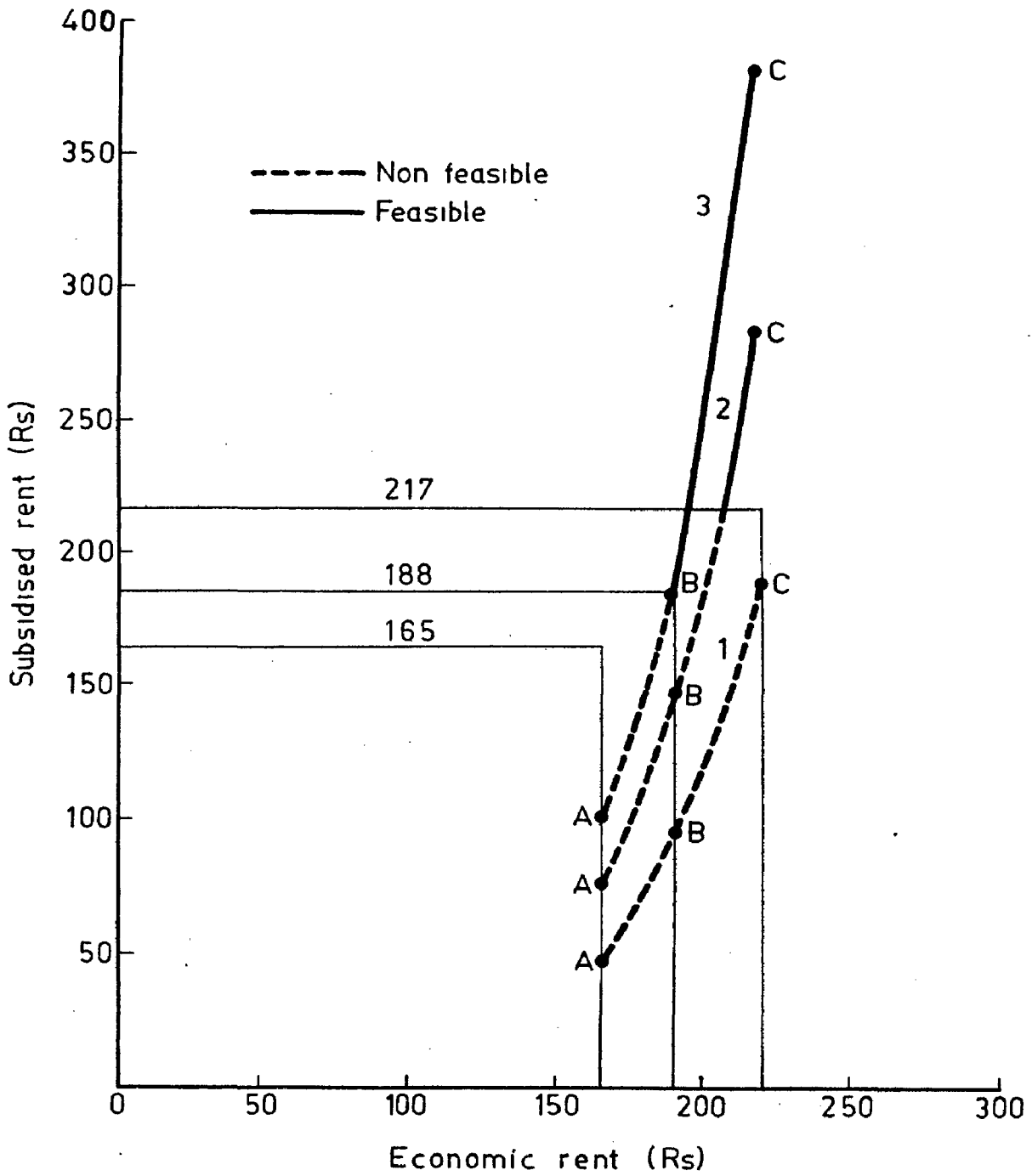
Feasibility range of rents at weights 0, 0·5 and 1·0 represented by 1 2 and 3 respectively

TABLE 21

Weight of 0.5 given to the subsidised rent

Category	Investment D.	No. of tenents	Economic rent/ month B.	Subsidised rent/month
A	19800	56	165	75.00
B	22567	96	188	142.5
C	26089	96	217	285

TABLE 22

Cate- gory	Cost	Economic rent /month/ tenent	Annual rate of return on investment (% based on subsidised rent)	PRS planned rate of subsidy.
A	19800	165.1	4.5	54.5
B	22567	188	7.5	24.2
C	26089	217	13.10	-31

TABLE 23

Weight of 1.0 given to the subsidised rent

Category	Investment	No. of tenents	Economic rent month	Subsidised rent/month
A	19800	56	165	100
B	22567	96	188	190
C	26089	96	217	380

TABLE 24

Returns

Category	Cost	Economic cost/month/tenant	Annual rate of return on investment (% based on subsidised rent.	PRS (planned rate of subsidy)
A	19300	163	6.0%	39
B	22367	180	10.10	- .01
C	26089	217	17.4	-75

As is obvio s from the above tables the returns on the investment in the last two categories namely B and C becomes positive at weight of 1 i.e., when R. 1 of investment is equivalent to 2 rupees of consumption. However the first category remains negative even at this weight.

As mentioned in the last chapter blighted areas use of almost one half to twice of the total community medical and institutional facilities and a similar proportion of police, fire and health welfare payments. As such a weight of 1.0 for low income housing may be justified.

If both aspects viz price escalation and social benefits to weaker sections of society are taken together, the benefits would be correspondingly greater.

Max Plot area	Category	In cities less than 4 lacks population	Population more than 4 lakhs
	EWS	99	60
	LIG	140	100
	MIG I	260	200
	MIG II	260	290
	HIG	420	420

ELIGIBILITY:

Provided the borrowers are competent under the bye laws constitution/statues governing them to raise laws for undertaking staff housing schemes:

EXTENT OF LOAN ASSISTANCE:

HUDCO'S loan assistance under the scheme will be limited to 70% of the total project cost the balance 30% being arranged by the borrower from his own resources. The loan for single unit will borrower not exceed Rs. 60,900.

SECURITY:

The loans will have to be secured by an unconditional and irrevocable guarantee from a scheduled bank.

C.U. RATE OF INTEREST:

Loans will be provided at the differential interest rates depending upon the income category to which the beneficiary belongs and all inclusive unit cost of houses. The rates ar

given above.

Unlike in the rental scheme, there is no explicit subsidy associated with hire purchase scheme. This, however, does not mean that there is no implied subsidy in the latter case. An estimate of the subsidy involved through rate of return analysis will be made. The corporations rate of return on investment is already specified. What remains to be seen is the private rate of return of the house owners.

Private return on investment (hirepurchase) - PR in the effective rate of return on the investment made by the individuals who benefit by the hirepurchase scheme is measured by PR in since the methodology for computing PR in is somewhat involved it is explained below.

From the individuals point of view this invetment consists of the initial deposit of down payment (C) only. Against this he receives three separate and identifiable benefits. (1) He becomes the full owner of an asset (H) in the form of a flat or house at the end of his contract period. (n). The present value of this asset which he acquires at the end of the contract period is part of his benefit stream. As the value of this property at the end of the contact period will normally have appreciated at a rate faster than the inflation rate even though some deteriration may take place in the house needing replacement, two alternatives taking the cost as full H and 2H have been adopted working out the present value. (2) Though he pays a series of instalments to HUDCO in the process of becoming an owner, he may earn an

additional benefit during every year of his contract period which may be approximated by the difference between annual economic rent P_o he would have paid for similar accommodation as he would have received had he leased it out, and the annual hire purchase instalment payment (Ph). This series of the net differential between the market and hirepurchase payment is in the nature of an opportunity cost and can legitimately be treated as a part of the benefit stream though he does not receive this differential in terms of actual monetary return

(3) Since the municipal or other local taxes on housing are levied on the rental value of the asset, there is a saving in tax which will accrue to individual as long as P_o exceeds Ph Municipal taxes on housing are often designed to favour home owner through the device of a lower tax rate on owner occupied houses. The difference between the tax, Te which would have been paid on Po and tax Th which individual pays on Ph is measure of the gain he derives by joining the hire purchase scheme while these benefits accrue to him, he must incur extra repair costs (Rh) annually which he would not have incurred had he rented the ho. ac/flat. Therefore benefit should be estimated net of Rh. From a private point of view, the individual will gain even more if the asset H appreciates over time. In terms of the model, the net annual flow of benefits received by the individual is attributable to the initial deposit Cd. The investment Cd was made at the beginning of the contract period so that he could earn this return.
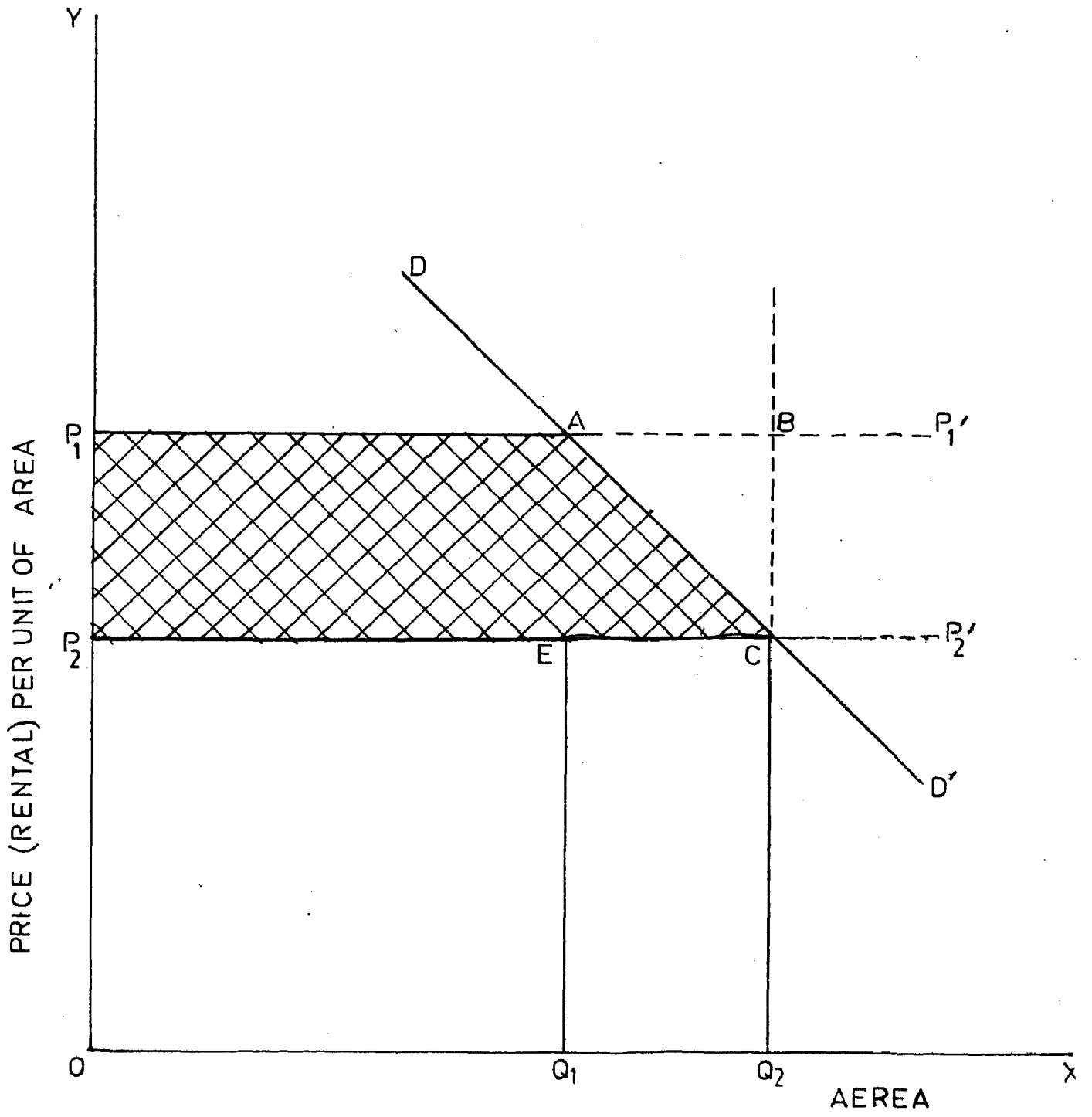
FIG 11

In the diagram we measure area on the X axis and price (rent) per unit of the area on Y axis. The downward sloping demand curve DD^1 shows that as the price per unit is reduced the individual would demand a larger area for accommodation. When the price is reduced from P_1 to P_2, a person would take the area OQ_2. The benefit he derives from this price reduction is given by the crossed hatched area P_1ACP_2, which consists of $P_1AB P_2$ representing the gain that accrues to him on account of price reduction and ACB which is a measure of consumers surplus. The geometric equivalent of (Pl-Ph) is the area P_1BCP_2. It can be seen therefore (Po-P1) overstates the private benefit by the area ABC. The smaller by this area relative to P_1ACP_2 the smaller the error due to overstatement of benefit. If the demand is in fact highly inelastic, the error caused by the use of (Po-Ph) as a measure of benefit will not be serious.

Po or the economic rent can be found out by income capitalisation method in which the cost of the house is discounted over its life time at a certain rate of interest. This interest has been taken as 10% which is the maximum interest one can obtain in gilt edged securities. The benefits described under items (1), (2) and (3) are received by the individual against the initial investment of the down payment. The discount rate at which the present value of income flow received over a period of years becomes equal to the value of the initial deposit is the private rate of return of the individual on the hire purchase scheme (PR Ir). In mathematical terms, an estimate

It may be argued that (Po-Ph) would tend to overstate the true benefit accruing to the individual, since it assumes that the demand for housing is completely price inelastic. There is an element of truth in the argument. It is most likely that individuals demand for housing is an essential item of consumption .

Given below is a diagrammatic exposition of the approach to the measurement of private benefits. (Fig 11)

In this analysis the tax component ignored for the sake of simplicity. (Po-Ph) is treated as a proxy for the net flow of benefits. Needless to add that other components could have been included without affecting the conclusions in any way.

of PR In can be obtained by solving for r in the following equation (18).

$$Cd = \sum_{t=1}^{n} \frac{(P_m - P_n) + (T - T_h) - R_h}{(1+z)^t} + \frac{H}{(1+z)^{n-1}}$$

or in case of 100% price appreciation

$$Cd = \sum_{t=1}^{n} \frac{((P_m - P_h) + (T_m - T_h) - R_h)}{(1+z)^t} + \frac{2H}{(1+z)^{n+1}}$$

For the purpose of this study H has been valuded at the same value as when it was taken over by the owner and at twice its value as an appreciation by this amount is likely in a big term. If PRIn thus estimated exceeds the rate that individuals could have earned from alternative longterm investments, the Housing Board is subidoing the individuals who join the hire purchase scheme. The argument that the corporation has not explicitly provided for this subsidy does not disprove the existance of the subsidy. We should also expect corporation's return on investment and PRIn to be inversely co-related for the same reasons.

The PRIn for the five categories of housing for low-income, middle income and high income has been calculated. The results are summarised in the table below:

TABLE 23

Category		Investment per flat	Corporations Boards return on investment	$PRIh_1$	$PRIh_2$
1		2	3	4	5
LIG	I	12000	5	19.5	22
LIG	II	18000	7	12.2	15
MIG	I	23000	9.5	8.2	14
MIG	II	42000	10.5	7	13.3
HIG		100,000	11.5	5.2	10.2

In column 3 above the corporations rate of return is given. In
column 4 the private rate of return when the depreciation in the
property is exactly compensated by the appreciation in value is
given . In column 5 the private rate of return when appreciation
is twice that of the cost is given. From the results it is seen
that the private rates of return are quite substantial. They
vary from 19.5% to 5.2% in columns 4 and 22% to 10% in column
5. The lowincome group can earn as much from this investment
as from any commercial alternative. However the private rate of
return in case of high income group is less and the corporations
policy of subsidising the lowincome group at the expense of
H.I.G. seems to be justified.

CONCLUSION:

The policy adopted by HUDCO for the financing of housing projects on hire purchase basis seems to be ~~so~~ viable and reasonable. The corporation's rate of return varies from 5% to 11% Though funds cannot be borrowed commercially on those rates, in accordance with national policy, for housing purposes nationalised banks, LIC and other public financing agencies can provide funds so that there is/no loss to the corporation in its hire purchase transactions.

If the value of the house is assumed to remain uncharged at the end of the contract period, private rate of return is 19.5% for LIGI category reducing to 5.2% for HIG category,. If 100% price appreciation in real terms is assumed, which is not unlikely at present trends, these rates workout to 22% and 10% respectively, Thus, even neglecting the considerable social benefit, the investment is very attractive to the low income group, and reasonable for the high income group. The above analysis indicates that HUDCO terms provide a sound basis for hire purchase systems,

CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1

Findings from case studies - Three case studies have been presented on different aspects of benefit-cost analysis in Chapter IV. The main findings from these are summarised below :

Case Study I - In this study economic comparisons of two design aspects have been made.

Problem I-A is concerned with the alternative expansion plan horizontally on the ground floor or vertically on upper floor. For the construction costs adopted, it is shown that taking opportunity cost of land into account, horizontal expansion is uneconomical where land cost is more than Rs. 15/- m^2, considering present land cost in urban areas- This means practically at all places,. Even if opportunity cost of land is ignored, horizontal expansion is uneconomical beyond a land cost Rs. 30/- m^2.

Problem I-B compares the costs of providing individual stair case access to a group of four houses with the alternative of a common stair case for 10 to 16 units with connecting corridors . It is found that it is more economical to provide individual stair case access to a group of four dwellings. In this case there is little doubt that convenience in non-money terms like better ventilation and privacy in the former case and the possibility of

nuisance caused by long common -corridors in a block of
flats in the latter case, further favours in-dividual stair
case access to a group of four.

Case study II- This analysis a block of 250
houses in three categories with plinth areas of 27.80 m^2,
32.26 m^2, and 39.50 m^2 respectively. The construction costs
of the three categories of houses have been worked out.
It is assumed that these houses are to be allotted to
Government Servants who would pay 10% of pay as rent. It
is also assumed that the Government receives indirect
benefit of 15% house rent allowance which would be payable
to the employees not provided with Government housing.
The Government rate of return is given in table 17 and comes
to 3.03%, 5.05% and 8.7% efor the three categories involving
a planned rate of subsidy of 69.6%, 59.66% and 12% respectively

The effects of using shadow prices for cement
steel and labour is shown in table 18. It is seen that the
higher shadow prices of cement and steel are practically
compensated by lowering in labour costs, and there is not
much change in economic rent. The planned rate of subsidy
now comes to '66%, 45% and 2% for the three categories.

It is well known that in an inflationery
economy, the prices of housing property rise faster than
the rate of inflation, and that is an important factor for

attracting investment in housing property. This aspect has been shown in Table 19. It is assumed that the prices of houses escalate at 5% per year in real terms. This raises the Government or owner's rate of return to 8.04%, 10.05% and 14.16% respectively and reduces the subsidy to 12%,- 12.8% and -55 %, the latter two cases of negative subsidy implying a profit over and above the economic rent.

Case study III - This considers another type of financing, viz. a case of a housing sbbemo constructed by HUDCO and given to the owners on hire purchase basis. The houses are of five different categories. It is shown that on basis of terms offered by it, the corporation's rate of return varies from 5% to 11.5%. Thus there is an element of subsidy in low income group housing, but over all the rate is more or less at par with Government borrowing rate.

The private rate of return depends the assumed value of asset at the end of the loan repayment period. Two alternative assumptions have been worked out. In the first it is assumed that the value of the house remains unchanged at the end of contract period- on this basis the private rate of return is 19.5% for L.I.G.I reducing to 5.2% for H.I.G. In the second assumption 100% price appreciation is assumed, which raises these rates to 22%

and 10% respectively. The analysis indicates that HUDCO's terms are fair for the corporation and attractive to the customers.

5.2 POLICY FOR HOUSING FINANCE

The future direction in promoting greater availbility of funds for housing schemes appears to lie in strengthening the cooperative housing finanae structure, the diversion of empolyees provident fund resources into housing and greater support from the commercial banks for low income housing. The Housing Development Finance Corporation has been providing financial assistance mainly for new residential housing schemes to individual cooperative, companies etc. and it is meeting the requirement of middle income housing to a significant extent. Data on investment in private housing is not available after 1976-77. During this year, approximately Rs. 22430 million are estimated to have been spent on private housing. Based on likely trends in the growth of private housing in the current Five Year Plans it is estimated that private sector investment will not be less than Rs. 115,000 million during Sixth Plan period of 1980-85. Additional investment by public sector enterprises, departmental undertakings and grants made to institutions may be of the order of Rs. 2500 to 3000 million. Since the

public sector outlay will be small in relation to the total investment, the maximum benefit from such an outlay will be achieved if public resources are largely devoted to low cost housing schemes like sites and services which will also capitalise on the exploitation of individual saving potential and labour inputs. Some of the surveys done in India and other countries emphasise the need for change in conventional low income housing finance strategy. The availability of credit for housing construction was not seen as a problem so much as elements like land infrastructure, building regulations and availability of materials. Most families preferred to add to their houses on an incremental basis as money and time becomes available. The world bank project in Madras has introduced a number of design options for sites and services, accompanied by housing loans by way of materials. It is realised that the financing institutions will have to adopt flexible criteria on financing as to what constitutes a house. Apart from taking steps for construction of new dwellings, it is realised that steps need to be taken to ensure the existing housing stock is preserved in a satisfactory state of repairs throughout its life span. According to studies undertaken by the HUDCO, the average cost of repairs to rehabilitate one SQ.MT of plinth area is between Rs. 90 to Rs.114 . On this basis a repair programme is cheaper than new construction. Even on the basis of

shelter years the economics is in favour of a repair progrra-
mme, the cost per household shelter year being Rs. 148.24 in
the case of repairs and Rs. 181.48 in the case of a new
construction. Again the repaired houses don't call for fresh
investment in infrastructure facilities except marginal
extension. A building repairs board has been functioning in
Bombay for undertaking repairs of dilapidated houses with
grants from State Government and the municipal corporation.
The construction industry as such has not become alive to the
possibilities of adding to the housing stock by rehabilita-
tion. However some initiative by way of redevelopment of
slums and dilapidated houses are being explored.

5.2a PRIVATE INVESTMENT

A number of steps need to be taken in order to
boost private building actively. These are by way of
incentives to the private construction sector as well as
individuals to mobilise savings for housing and other forms
of construction, and by way of removal of certain disabili-
ties in the way of rapid construction. Institutional finance
from HUDCO and other concerns could be made available to
private builders for undertaking EWS/LIG housing in urban
and rural areas where the state agencies have not been able
to take up schemes. Similar facilities could be made availa-
ble to private parties who have excess vacant land in the
peri/phery of large cities and want to take advantage of the

provisions of the Urban Land (Ceiling and Regulation)
Act for construction of houses for low income categories.
The co-operative housing societies could be assisted by
provision of funds to the apex housing society by
creating suitable frame work to accept alienation of
individual flats on pattern of Apartment Ownership Act
in Mahrashtra. While public agencies are alloting
developed or undeveloped plots to the housing co-operatives
in Delhi and other cities , special stimuli like a management
subsidy are needed to encourage the co-operative housing
societies of poor people. In order to attract sufficient
amount of prøvate sector savings into the construction and
housing industry, certain type of housing activity can be
held as industry and incentives currently available to total
industry could be made available to housing. A substantial
number of private enterpreneurs will be attracted to this
field if the fiscal incentives and credit facilities available
to similar forms of construction are made applicable for
the companies involved in housing. Further steps could be
for the GIC to introduce a scheme of ensuring mortagage for
sale of houses flats by private builders on hire purchase
basis. This may be coupled with the creation of a secondary
mortgage market in housing finance. The industrial concerns
who got licenses for setting up as expansion of industries,
should be made to bear the social responsibility of providing

housing facilities to their workers with a view to
improving the productivity and ensuring harmonious labour
relations. In order to mobilise individual savings into
housing on the pattern of building societies in U.K. ,
investment and shares or deposits of recognised, housing
finance institutions may be held eligible for tax relief.

5.2 b   RENT CONTROL

The Rent Control Act in the urban areas is widely
believed to be responsible for determining private investment
in housing. The rent control regulation aimed to distri-
bute the capital gains between the land lord and the
tenant, but since the rent was fixed with reference to
a particular year, the concept of standard rent for the
houses has frozen the rents. Consequently, the land lord
has no incentive to maintain his property on a diminishing
real rental income and thus a gradual dereliction of
housing stock is a major problem in the big cities. A
number of alternatives to enable the rent act to reflect
periodic adjustments of rents in accordance with the increa-
se in maintance cost has been proposed and the whole problem
is engaging the attention of the Government. Possible modifi-
cations in the Rent Control Act will also be looked into
by the Economic Administrative Reforms Commission recently
set up by the Government. Apart from taking steps to attract

sufficient amount of private investments into housing
activity, the question of utilising available resources
for the construction of largest possible number of dwellings
is also engaging the attention of the government. Slowing
down the growth of urban population especially in large
cities where building costs are many times those in small
cities and rural areas is also an area which is being
investigated.

5.3 BUILDING MATERIALS

Production of building materials also plays an
important role in development of housing, buildings, and
infrastructural components of human settlement. During the
past few decades India has made significant progress in
manufacture of commonly used building materials like bricks
cement, steel etc. The installed capacity for the manu-
facture of these materials matches well with the require-
ments but the recent price rise in fossil fuels has led
to steep rise in prices. As far as other and /or alternative
materials are concerned, their decentralised production
creates problems of quality control. It concerns not only
the building materials but also the control of environmental
pollution as well as the working environment under which
manpower has to function.

Proper planning and monitoring of production of the building materials in relation to the construction programme in all sectors is also of importance. One reason for the escalating prices of building materials is the dualism in demand and supply. Governments prepare plans for their own housing and other building materials is left to the private sector and the demand estimates for the materials are not always built into the plans for augmentation of capacities. The building material sector does not coordinate its expansion programmes with the projected materials demand from different sectors both due to inadequate information and due to delayed preparatory action. This leads to time lag in increased availability which in turn provides an impetus to the price rise of building materials. It is therefore necessary that the formal sectors(government and semi-government) work out their material requirements in advance after identifying to mix of engineering alternatives for various types of construction.

Since the production of building materials is of a crucial importance, a many sided approach to the problem is urgently required. This calls for the following steps:

- Judicious use of conventional building materials

- Application of materials which are available but are not currently in use e.g. secondry species of timber.

- Research and development on new building materials which make use of agricultural, industrial and mining wastes.

- Preference for materials which consume less high grade energy in their production.

- Upgrading of traditional materials (like, mud,thatch, bamboo etc.) in rural settlements in such a waybthat firstly their quantitative requirements arenreduced and secondly they have a longer maintenance free life.

Building materials accounts for nearly two thirds of the total cost of building in developing countries. Thus the following criteria could be considered most appropriate.

- Plants and tools required for the manufacture of building materials should be simple and inexpensive as possible.

- Minimum amount of energies from oil, coal and electricity be required in the manufacture of materials. Possibilities of utilisation of alternative energies like solar and wind energy be exploited.

- The process of manufacture should be such that minimum amount of pollution is added to our air, water, and land resources.

- The manufacturing process should not require mass migration of working population from their traditional habitat.

- Building materials used in housing should be local as far as possible and the technology be geared accordingly.

- Building materials should be such that can be replenished in nature as far as possible and within a reasonable span of time.

5.4 THE NEW LAND SCAPE

In order to tackle the growing problem of housing it might be necessary to start from the grass roots level. In India it has been estimated that if the present rural monthly income of Rs. 55 per capita is to be maintained, somewhere between 160 to 210 million people over the next 25 years will have to leave the rural areas. Several options can be suggested. The first and most obvious one of increasing non-agrarian employment in the villages is not as easy as it appears- principally because of the investment in infrastructure involved in carrying out such a programme in all the several hundered thousand villages of India. What might perhaps prove to be a more viable strategy is the programme of village cluster of 5 or 6 villages. A school, a dispensary, some cottage industry- so that people can continue

to use the stock of village housing while the whole cluster grows into a town. In another and parallel strategy investment in small and middle -sized towns should be made. This policy has been in operation in India over the last two decades and today many of the medium-size towns are growing at a faster rate than are Bombay, Calcutta and Delhi.

Yet even if these policies are pursued, they still have a long gestation period, and the growth of a large metropolis will not come to a grinding halt . To provide adequate shelter for their growing influx in population, some basic issues must be faced. The first is land policy. In most thirdworld cities the land is privately owned, a pattern which has not been able to generate housing for the urban destitute. There are several reasons for this. First of all, owning urban land is not the prerogative of the vast majority, but of only a small fraction of the richer people and they see land as an economic commodity, one which escalates faster than most other investments Also because of the desperately low income level, housing begins to be profitable only at the level of top 20% or so of the population. Hence the disproportionate amount of high income housing that gets built- while practically no houses are constructed for low income groups.

Attempts have been made to provide sites and services scheme. But most of these schemes have to be located on inexpensive land on edge of town; land which does not have access to public transport and other urban infrastructure. Without transport there is no job choice—often no job at all. So the poor move back on the pavements, around railway stations.

Public ownership of all urban land may remove this anamoly, but it is not, in itself , the panacea for, obviously different locations in a city are not equally desirable; nor will it increase, at the colassal scale required, the total supply of desirable urban land.

The second crucial issue is the fundamental changes that must be brought in the approach to land use planning. A typical Third World metropolis today has an archaic structure (of colonial or feudal heritage) which bears almost no relation to the needs of its current population. As the pressure builds on this inadequate structure, the densities go up, and with them the construction costs. The result is that the poor get squeezed on to the pavements. To provide housing on the scale needed entails a metamorphosis of the city structure, easing the pressure on land by the redeployment of jobs and hence the pattern of desired locations.

Through this kind of restructuring a dynamic and open pattern must be generated, a pattern which will not only cater to current demands but also those estimated over the next few decades.

Open land is needed for the city as also a need to allocate a greater percentage of this land to residential use. Less than 20% of landuse in most cities is allocated to residential building sites. An increase in this area would mean only a marginally larger city- but could make decisive savings in the cost of the housing. For housing costs are directly related to densities, and the question of providing shelter for the poor is not so much a matter of finding subsidies but premarily a question of changing land use allocations.

The third issue is the type of house or the housing pattern that should be provided. In the tropical climate of India where many functions can be performed outdoors it is more economic to go in far low rise housing instead of high rise buildings. The low cost housing is pluralistic and incremental an important asset in most Third World Countries where present income levels cannot provide more than a single room, if that, far an average urban family.

Another aspect of this design decision is that while low cost houses can be made by selfhelp or by an

experienced mason high rise buildings call for more
sophisticated technology. Usually the monopoly of a handful
of large construction firms.

Finally it can be stated that housing is such
an essential human need, that intangible benefits like
mental satisfaction, better health, lower crime rates, are
as important as direct economic return. The technique
of social benefit- cost analysis can be used to demonstrate
the comparative overall benefits of the housing sector in
relation to other sectors of the economy.

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