CHAPTER I

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CHAPTER I

INTRODUCTION

"There are limits to the rate at which a country can fruitfully step up its capital formation. Of this, the two most important limits are shortage of skill and inadequacy of public utilities. Shortage of skill not only prevents people from using capital fruitfully; but sometimes may prevent them from using it at all. More than half of capital formation consists of work in construction. Hence the expansion of capital is a function of the rate at which the construction industry can be expanded. Economic plans cannot be executed if there are not the carpenters, the masons, the electricians and the engineers to do the necessary construction, whether it be of roads, bridges, dams, factories, power plants, houses or the rest." Hence the construction industry plays a very strategic role in the process of economic development of a country.

1. Construction Sector as an Informal Sector

Meaning of Informal Sector:— The concept 'informal sector' was first defined as that part of the labour-force in urban areas which is outside the organised labour-market. It

comprises the mass of construction labourers, hawkers, rickshaw pullers, hotel boys, shoeshine boys, domestic servants, barbers, washermen, thelawalas, panwalas, watersuppliers, acrobates and others.

Role in Urban Economy: Informal sector in the urban areas is the major source of employment for the urban poor. The rate of growth of employment in the formal sector, owing to its capital-intensive character, is very slow to absorb the increasing rate of growth of labour-force. The employment in the informal sector is estimated to be 60-70 percent in Nairobi, 50 percent in Jakarta and about 45 percent in Calcutta, Bombay and Ahmedabad.

The urban informal sector gives ready-made employment market to the rural migrants. Usually, the origins of informal sector are attributed to the massive outflow of surplus labourers from the agricultural sector in the rural areas. These rural migrants form a substantial part of the urban poor in informal sector. All rural poor migrants are not necessarily coming to cities and towns to settle down permanently. Usually, migration of rural poor including landless agricultural labourers, marginal farmers and others, takes place at the time of flood, drought and other natural calamities. Some of these people return to their native places after the natural calamity is over. Thus, the informal sector gives some type of reliefs in the people in the drought-prone and flood-affected areas.
The informal sector helps to some extent in removing the seasonal unemployment among the agricultural labourers, marginal and poor farmers. The income in the urban informal sector may be low but the chances of employment in this sector are much better than in the rural areas. Also the standard of living in urban areas with medical, educational and municipal facilities, however restricted they may be, is higher than in the rural areas.

Children, old women, handicapped and maimed people are found in the urban informal sector. The formal sector forbids employment of children below a certain age, lays down strict conditions for the appointment of women and requires particular levels of formal training. Women labourers who face difficulties in getting jobs in organised industries and government departments, are employed in the informal sector as construction labourers (known as "Rejas"). The formal sector mostly depends on the informal sector. The informal sector's supply of cheap labourers to formal sector is its main contribution to the urban economy. The existence of the formal sector is totally impossible without the help from the informal sector in all developing countries.

2. Role of Construction Industry in Economic Development

The role of construction industry in economic development need not be over emphasised. The thrust of the

argument has been that construction industry produces capital almost without any capital and thus constitutes a basic component in the development programme for stimulating growth in less developed countries. Studies have also put forth statistical evidence to show that construction sector's share in G.D.P. increases with the increasing per capita G.D.P. It cannot also be denied that construction sector makes an important contribution for meeting the basic development objectives including employment creation, output generation and income redistribution.

In any country, be it developed or developing, the construction activity is a vital activity. The construction industry provides a means of transforming the aspirations for the social and economic well-being of a nation, into reality by providing housing, industrial and infrastructural facilities. Thus it creates an environment, conducive to raising the standards of living of people of the nation.

The construction industry is not a 'trade' or a 'service' activity but a 'production activity'. Whatever the activity the construction industry is engaged in the ultimate result is 'product' - a building, a bridge, a temple and so on.

There is not a single sector of the national development where the construction industry does not play an important role. It is estimated that in the 'Sixth Indian National Plan' the construction sector accounts for about rupees 43,000 crores, out of the total plan outlay of about rupees 90,000 crores. Out of this, housing sector alone accounts for about 25 percent, or rupees 12,000 crores.

According to some estimates, in developing countries 90 percent goes in new construction and 10 percent in the maintenance and repairs. It is estimated that 40 percent goes in housing and connected infrastructure and 20 percent in industrial structure and 40 percent in other civil engineering works.

The 'Indian National Buildings Organisation' had analysed the components in different sectors - community development - 50 percent, Thermal energy - 20 percent, Hydel energy - 65 percent, Health - 20 percent, Education - 20 percent, and social welfare - 20 percent etc. Thus, the construction has its contribution in all sectors of national development. It has been calculated that construction projects in the 6th plan is likely to generate employment to around 15 million man-years or will provide jobs on a continuous basis to 3 million persons on an average.

Another important factor is the role of construction sector in 'exports'. Construction exports is one of the major foreign exchange earners. To the Indian construction has to face keen competition from overseas construction industry which is more productive and more efficient.
The construction sector covers vast areas of operation. It covers architecture, engineering, design construction and maintenance and repairs. It covers small hut construction to major engineering structure. It includes production, supply and transport of all kinds of building material. It is mobile, seasonal and more labour intensive than other industries.

Thus, as an industry, building is of major importance to the national economy because of its sensitivity to and influence on the course of business cycle, and because of its relationship to national economic development. As the product of an industry building is a vital welfare good; and the concern about the building industry and the building market focuses on their failure to provide a standard of living compatible with the expanding economy, and with growing personal and national income and wealth. The importance of the buildings in the economy can be measured in terms of employment, production, investment, or consumer expenditures.

3. Employment in the Building Industry

The building industry represents an important branch of the national economy. In terms of employment it is one of the largest single industries in India.

A comparable picture of occupational structure in the building industry in India and Raipur city is presented
in Table 1.1. It shows that according to the 1981 census, it employed 29.40 lakhs labourers accounting for 1.52 percent of the country’s total labour-force.

According to that census, this industry in Raipur city p employed 1.26 percent labourers of the city’s total labour-force.

4. **Types of Labourers in the Building Industry**

The building construction labourers are divided into three categories, viz., skilled, semi-skilled and unskilled, as defined in the notification issued by the government under the Minimum Wages Act, 1948, as given below:

I. **Skilled Labourers** :- Masons, Painters, Carpenters, Plumbers, Electricians, Machine Operators, Steel Benders etc.

II. **Semi-Skilled Labourers** :- Glaziers, Scaffolders, watersprayers etc.

III. **Unskilled Labourers** :- Helpers/Coolie, Reja etc.

These three categories of labourers display basic differences in skill, remuneration and work-assignment.

5. Census of India, 1981, Series I, Part II, Special Reports and Tables based on 5 percent sample data.

TABLE 1.1

OCCUPATIONAL DISTRIBUTION OF THE LABOURERS: EMPLOYMENT IN THE BUILDING INDUSTRY

INDIA AND RAIPUR

(In percentage)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cultivators</td>
<td>37.87</td>
<td>38.45</td>
<td>3.83</td>
<td>2.41</td>
</tr>
<tr>
<td>2.</td>
<td>Agricultural Labourers</td>
<td>36.20</td>
<td>32.87</td>
<td>2.22</td>
<td>2.47</td>
</tr>
<tr>
<td>3.</td>
<td>Household Industry</td>
<td>3.83</td>
<td>3.89</td>
<td>3.60</td>
<td>1.89</td>
</tr>
<tr>
<td>4.</td>
<td>Construction</td>
<td>1.03</td>
<td>1.32</td>
<td>4.42</td>
<td>3.86</td>
</tr>
<tr>
<td>5.</td>
<td>Marginal and other workers</td>
<td>21.07</td>
<td>23.47</td>
<td>85.93</td>
<td>89.37</td>
</tr>
</tbody>
</table>

Total Workers | 100.0 | 100.0 | 100.0 | 100.0 |
Total Population | 5471.30 | 6638.10 | 1.74518 | 3.38245 |

In Raipur city, it is observed that there is lack of proper division of labour among the building construction labourers. Most of the semi-skilled workers are mainly done by the skilled labourers. Therefore it becomes unnecessary to make a separate category for semi-skilled workers.

5. Building Cost

Building cost across the size class of capital is presented in Table 1.2. It is observed that the percentage of labour cost is 25.10 percent which is more than one-fourth of the total building cost. It is also observed that across the size class of capital, the cost of raw materials increases with the capital size while that of labour cost decreases.

<table>
<thead>
<tr>
<th>Capital Size (Lakh)</th>
<th>Building Cost (in %)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour Cost</td>
<td>Raw Material Cost</td>
</tr>
<tr>
<td>Less than 1</td>
<td>23.48</td>
<td>63.64</td>
</tr>
<tr>
<td>1 - 5</td>
<td>25.53</td>
<td>65.89</td>
</tr>
<tr>
<td>5 and above</td>
<td>24.20</td>
<td>66.67</td>
</tr>
<tr>
<td>Total</td>
<td>25.10</td>
<td>66.10</td>
</tr>
</tbody>
</table>

Source: Sample Survey.
6. Review of Literature

In this section an humble attempt is made to present a succinct review the existing relevant literatures on construction labourers.

The characteristic features of the building industry have been well known, and yet no enough quantitative information is available on them. In India, the first attempt at collecting basic information on wages and working conditions in the building industry was made by the Labour Bureau in 1954. The spur for the investigation was provided by the government's realization that it did not have the necessary data either for planning purposes or to meet the requirements of its membership in the ILO'S Industrial Committee on Building, Civil Engineering and Public Works. This was a hurried survey and could do no more than touching the fringe of the problem. Nevertheless, the report succeeded in indicating "the general problems concerning labour in the Building and Construction Industry and to focus public attention on some of the more pressing needs of the workers."

The Planning Commission had recommended in the Second Five Year Plan that the government should regulate contract system and "secure for contract labour, the conditions and protection enjoyed by other workers engaged

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8. Ibid, p.c.
by the principal employer, and set up a scheme for decasualiza-
泽ation, wherever feasible. Accordingly, the Labour Bureau
was entrusted with the task of making a thorough survey of
five major industries employing contract labour including
the building and construction industry. It produced a
detailed report containing a large mass of data and much
useful factual information. However, there was little by
way of analysis. The Bureau did not even bother to summarize
its findings and draw appropriate conclusions. Apparently,
this task was left to the users of the data.

The second report of the Labour Bureau was followed
by the first significant research effort undertaken by the
Shri Ram Centre for Industrial Relations. In a study
focused on Kota, the newly Industrializing Centre in
Rajasthan, Vaid and Singh analysed the data collected directly
from a sample of 450 workers.

A study on employment relationship in the building
industry was undertaken at the instance of the National
Buildings Organization. This study provides a compre-
prehensive analysis of the nature and structure of employment
relationship in the building industry. The study concludes

9. Labour Bureau, Contract Labour: A Survey of Selected
   Industries, 1957-61, Delhi, Manager of Publications, p.(i).
10. The Committee on Labour Welfare of the Government of
    India in its report (1967) drew heavily on Labour Bureau
    data. From its report (pp. 407-426) it seems that the
    Committee had practically no other source of information
    on the industry.
11. Vaid, K.N. and Gurdial Singh, Contract Labour in
    Construction Industry, A Study in Rajasthan, New Delhi,
    Shri Ram Centre Press, 1966.
12. Johnri, C.M. and J.V. Pandey, Employment Relationship in
    the Building Industry, A Study in Delhi, Shri Ram Centre
    for Industrial Relations and Human Resources, New Delhi, 197
that the entire structure of employment relationship in this industry is caught in a social framework of mutually reinforcing vicious circles of illiteracy, a social backwardness, lack of organization, low wages, small size of firms, and backward technology. According to the authors there is complete absence of dynamic forces within the industry. The vast reserves of unemployed and underemployed workers in the rural areas enable the industry to expand and shrink with fluctuations in demand for its services without registering any impetus for change. Thus, accordingly, recommend a radical departure in public policy through decasualization of Labour in the hope that it will simultaneously delink the industry from its static hinterland and release the process of technological and structural changes.

The employment relation of the building construction in some urban centres in the northern region of India has already been studied. Such a study is attempted in Ahmedabad an urban centre of the western region. The study was conducted among the workers and builders on selected work sites. It covers a sample of 1000 labourers working in different construction work-sites. This study provides an overview of structural characteristics of building construction activity in Ahmedabad. The nature of product

market and technology; the building contractors; size and capital intensity, production function, productivity and factor shares and the role of labour subcontractor in the supply of building workers are widely analysed in this study. A detail examination of the workers' wages, earnings and conditions of work and an attempt at portraying levels of living of building workers of the city by a detailed analysis of their family size, workers, household income and expenditure, poverty profile and living conditions are also made in this study. The building construction in Ahmedabad city is organized around a number of small organisationally unrelated functionaries brought together through a complex contracting system, in which the general builder-contractor is the key figure. The study finds that 75 percent of the households and 73 percent in terms of persons of the sample are poor- they are living below the urban poverty line of a percapita expenditure of Rs. 80.34 at 1977-78 prices.

The National Commission on Labour appointed the Study Group for the Construction Industry in its attempt to understand the changes in conditions of Labour in the industry since independence. This was one of the series of study group was required to analyse available information and project its thinking on labour problems in the Construction Industry for the years to come taking into account the

possible development is the industry. The report concludes that:

(i) The construction industry is governed by hardly any regulative or protective legislation.

(ii) The government is the largest principal employer (sponsoring authority) in the construction industry. By devoting some care to the planning and co-ordination among different Governments and local authorities, it would be possible to phase the launching of major construction projects in such a way that a reasonably steady volume of work and level of employment are maintained.

(iii) The un-regulated entry of contractors into the industry regardless of qualifications or resources has been a major cause of chaotic labour conditions and much sub-standard and slipshod work.

(iv) Different authorities fix different Minimum Wages applicable to the same area or region. Contractors, however, cannot pay different wages to their workers in the same region on different projects. This puts the contractors to much of inconvenience and loss.

(v) The system of wage payment in the building industry is that the contractor pays the sub-contractors on piece-rates, but the later pay individual workers by

daily rates. This leads to complaints of non-payment or lower-payment by workers.

(vi) Wages in the construction industry are mostly fixed under the Minimum Wages Act and are low as compared to those in organised industries.

(vii) Working and living conditions of the construction workers are appealing. In the absence of specific legislation improvements therein cannot be enforced.

(viii) Construction workers are not strongly unionised, the cause being the casual nature of employment, the attitude of contractors, the Government rules regarding recognition and the lack of determined organising efforts by the trade union movement itself. Only stronger unions will be able to ensure real improvement in the workers' conditions as in the Western countries.

(ix) Employers in the industry are also not well-organised. Fair conditions for labour as also proper standards of work will be possible only if the industry itself properly regulates the qualifications and conduct of the contractors.

(x) Use of machines for construction work is not usually economical in India and has an adverse effect on employment. But labour productivity could be increased by better training of skilled workers, better organisation of work; greater technical
competence of contractors and sub-contractors, and above all, better nutrition and living standards of workers.

The ICSSR sponsored two studies on women construction workers, one in Delhi covering nine construction sites and one in Bihar covering two major government projects. These studies were exploratory and illustrative rather than exhaustive. The purpose was to ascertain the socio-demographic characteristics of women in this industry, the systems of recruitment, general service conditions, type of work and wage rates, health, living and welfare facilities and economic conditions in order to identify and assess the specific nature of their problems. While the Delhi study covered mainly workers in private construction projects, the Bihar study concentrated entirely on workers in government projects. Both the reports indicate that attempts to protect these workers—whether by law or by official regulations—generally end in futility because of the unorganised nature of this labour, their helpless dependence on unscrupulous intermediaries and the unskilled nature of their work which makes them easily dispensable. An important contribution of these studies is that they help to explode the myth that women do not engage in occupations which involve hard and arduous physical labour.

A study of unskilled labour markets for civil construction was proposed by the Transport Research Division of the Bank within its ongoing major study of the Substitution of Labour and Equipment in Civil Construction. Based essentially on the author's field investigation in spring 1975 of some civil construction projects in rural India, this study represents a first attempt in that direction. It discusses the sources, wages and methods of recruitment of construction labourers, the extent of female participation and male-female wage differential. It examines the responsiveness of labour supply to wages, tries to identify the important determinants of construction labour supply, and focuses attention on the areas in which future research is likely to be productive.

S.N. Guha Thakurta made a field study of the roads and building construction industry of the Union Territory of Tripura. This study indicates that the period of involving unemployment is not significant enough to cause serious anxiety, but that, on the other hand, the uncertainty for the workers is enormous. The co-existence of relatively high continuous employment and an air of anxiety and uncertainty calls for special study in any scheme of decasualisation.


A paper on the construction industry was prepared by the Construction Industry Unit of the World Bank's Transportation Department in the year 1984. The primary purpose of this paper was to suggest directions and emphasize for future actions by the bank to promote the development of the domestic construction industry in developing countries. The report was heavily based on the bank's experience over ten years. It aims to draw the attention of the widest possible readership to the problems of developing the construction industry as well as to the opportunities that exist to improve the efficiency of this important sector of the economy.

There are few studies about the building industry and labourers. Such type of study is also attempted in


The author of the study concluded that housing and other social construction lagged considerably behind the growth of the urban population. The Chinese planners were engrossed with industrial construction, with the result that already low standards of housing, schools, and hospitals were further impaired. The author also concluded that the general trend of employment in the building construction industry showed an impressively rapid growth, rising from 400,000 in 1950 to nearly 3 million in 1958. The majority of men were employed under the construction Engineering Ministry and in regional enterprises under the City Construction Bureau.

The present study on income and employment of the labourers in the building industry in Raipur city provides a comprehensive analysis of income and employment of labourers in the building industry of the city. The study also provides the labourers' job satisfaction and their productivity in the building industry.

7. The Problem of study

There are few studies about the building construction labourers in India. Such studies were made in the

cities like Delhi, Ahmedabad and Rajasthan. But one has little idea of the income and employment pattern of the persons who are engaged in the construction of buildings in Raipur city. Do they get employment all the year round or their employment is seasonal? What is level of productivity of labour and capital? How many of them are living below the urban poverty line and what measures should be adopted to improve their income and employment conditions?

Therefore, an attempt has been made to find out the answers to the questions raised above. Hence there is the need for the present study.

8. Objectives of the Study

In the light of various aspects of the problems the main objectives of the present study may be stated as follows:

(i) To examine the income level of different categories of labourers in the building construction industry in Raipur city and to estimate the productivity of labour and capital in the construction industry.


(ii) To find out the number of months and days for which the labourers get employment in the building construction industry.

(iii) To assess the proportion of the total sampled labourers living below the poverty line.

9. Reference Year

The reference year of the present study is 1983.

10. The Scope of the Study

The study is based on interviews of 100 labourers, working in different 8 building construction work-sites in Raipur city on the basis of pre-structured schedules. Direct observation of the work-process at selected work-sites and informal discussions with some of the contractors and builders forms part of the investigation.

The scope of the present study is mainly confined to the urban area of M.P., Raipur city in particular. The survey covers the construction of factories, shops, educational institutions, government and private housing etc.

A segment of the construction industry excluded from the present study is road construction and repairing and development of land. Though these form an important
part of the construction industry, it was not found practicable to cover the labourers engaged in these work-sites mainly because of their transitory scattered and migratory character.

11. Limitations

(i) Only skilled and unskilled labourers have been considered in the present study. Engineers and architects are excluded from it.

(ii) The present study is confined to the urban areas of Raipur city.

(iii) Out of three typical construction operations, this study covers the construction of buildings only.

12. Research Methodology

In this part the methodology of collection of data, analysis of data and sample design are discussed.

A. Data Required:

In view of the objectives of the study it was necessary to collect the relevant data. The following data were required:
(i) Data about socio-economic characteristics of the building construction labourers i.e. sex, caste, marital status, educational level, work-status etc.

(ii) Data regarding the income of different categories of labourers working in the building construction industry.

(iii) Data regarding employment and conditions of work of the building construction labourers.

B. Sample Design

The present study is mainly based on the primary information collected from a sample of 200 labourers and 8 building contractors on the basis of schedules. It was decided to cover a sample of 200 labourers working in different 8 building construction work-sites in Raipur city.

The data were collected from the building construction labourers on selected work-sites. In the first instance, information regarding all building construction work-sites in progress in Raipur city in the month of March-April 1983 was collected. A sample of 200 labourers was taken for the present study. A construction site was found to employ on an average 25 labourers. Applying this average, it was expected that a census of labourers in 8 building construction work-sites will give us the desired number (200) of labourers.
C. The Collection of Data

The primary data regarding income and employment of building construction labourers were collected by survey method through personal interview. For this purpose a structured schedule was prepared and processed before starting the interviews. The data thus collected are reliable, subject to the information supplied by building construction labourers working in Raipur city, based on their remembrance of facts.

D. Sample Size

This study covers 200 sampled labourers working in the building construction industry in Raipur city. The sample labourers are so selected that the selection process gave equiprobability of selection to every work-site in the Raipur city.

E. Concepts and Definitions

The important concepts and definitions used in this study are labour, building, building construction labourers, skilled labourers, unskilled labourers, regular labourers, casual labourers, household dependents wages, income, household income, employment, working days and so on. These are as follows:

(i) Labour

Any exertion of body or mind under taken for the sake of reward or remuneration is termed as labour.
(ii) Building

A 'Building' is generally a single structure on the ground. Sometimes it is made up of two or more component units which are used or likely to be used as dwellings (residences) or establishments such as shops, business-houses, offices, factories, workshops, schools, places of entertainment, places of worship, godowns, stores, etc. It is also possible that buildings which have component units may be used for a combination of purposes such as shop-cum-residence, workshop-cum-residence, office-cum-residence etc.

(iii) Construction Work

This includes the erection of new buildings, immobile structures, and public utilities — together with service facilities that become integral parts of the buildings and structures and are essential to their use for any general purpose — and the restoration and alteration of existing buildings and structures. This immobile structures include dams, reservoirs, canals, docks, mines, refineries, highways, airfields, bridges and railways. Utilities include power transmission and distribution lines, petroleum pipelines, water supply lines and sewers. Service facilities include plumbing, heating and lighting equipment, sanitation fixtures, and elevators. Construction also includes the demolition of existing structures or obstacles of construction.²⁵

clearing land, landscaping, and the placing and for fostering of perennial plants. It does not include any "major repair" or "minor repair" of existing building and structures.

(iv) **Building Construction Labourers**

They are persons employed in construction of buildings and perform various tasks in connection with masonry, carpentry, plumbing, smithy, kuliwork etc. Their labour is performed under the direction of someone else and they work for payments in cash or in kind or in both. Thus, all those who work in building construction sector on wages, whether in cash or in kind or in both, are considered as building construction labourers.

(v) **Skilled Labourers**

They are persons employed in building construction industry having some skills in occupations like masonry, carpentry, plumbing, smithy etc. Their wage rates are higher as compared to the unskilled labourers. Masons, carpenters, painters, electricians, plumbers etc are known as skilled labourers.

26. See C.H.C.C., 1957, No.5, p.29, This refers only to the plans surrounding a new building. The general activity of forestation is treated as accumulation for working capital. Sec T.C.K.T., 1957 1957, November 19, p. 13.

(vi) **Unskilled Labourers**

Unskilled labourers have not any skill or training in their occupations. So, their wage rates are always lower than skilled labourers. Helpers/coolie and rejas are known as unskilled labourers in the building construction industry.

(vii) **Regular Labourers**

Building construction labourers who have been in continuous employment under some contract or on some particular understanding during the whole year are considered as regular labourers. The work may be irregular due to periodical or seasonal variations.

(viii) **Casual Labourers**

Building construction labourers who have not been in continuous employment and have also been working irregularly in the past seasonally or occasionally are considered as casual labourers.

(ix) **Household**

It includes all persons who are related by blood, marriage, or adoption and who normally, take meals in the same kitchen. The domestic servants, farm labourers and unrelated boarders residing with the household are not
counted as members of the household. So, it constitutes all the residing members but excludes guests. However, temporary absentees are included in it.

If a group of related persons do not have their common kitchens, each one of them will constitute a separate household if there is a separate kitchen. When a group of unrelated persons live together, each one of them constitutes a separate household.

(x) **Dependents**

This category includes all dependents such as infants and children, not attending school or persons permanently disabled to do any work because of illness or old age. It includes even ablebodied persons who could not be categorised in any other category of non-worker but who are dependent on others. But such persons who are dependent on others for subsistence, and who are seeking jobs are categorised as 'other non-workers.'

(xi) **Wages**

Wages mean any amount received for any work done or services rendered during the period of the project. This may be in cash or in kind or in both.
(xii) Income

Income is deemed to comprise of all the earnings and receipts from any work, service, landed property, interest etc. It, however, does not include capital receipts or gains.

(xiii) Employment: Employed Persons

Any person who performs some work for a payment or profit on the day of investigation is considered as 'employed.'

(xiv) Local Labourers

Those who commute on foot from their home in every working day lived in villages within about 10 miles from sites, are considered local labourers.

(xv) Non-Local Labourers

Those who come from different areas outside the area of Raipur city are considered non-local. They leave home in late October and return home in late May or early June. During the construction works, they usually live close to the construction sites.
13. **Analysis of Data**

Various statistical tools have been used in this study to fulfill the objectives set forth in this enquiry. For the analysis of primary data collected from field investigation, regarding the building construction labourers' age, castes, occupations, income, job satisfaction etc. have been worked out by using the simple mean, percentage, standard deviation, co-efficient of variation and chi-square test in this study.

The formula of standard deviation and co-efficient of variation used in this study are given below:

(i) **Standard Deviation**

\[
S.D. = \sqrt{\frac{\sum d^2}{N}}
\]

where

- \(d^2\) = Square of Deviation from mean
- \(N\) = Number of items.

(ii) **Co-efficient of Variation**

\[
C.V. = \frac{S.D.}{\bar{a}} \times 100
\]

where

- \(S.D.\) = Standard Deviation
- \(\bar{a}\) = Arithmetic mean.
To find out the respondents and their fathers' educational levels and respondents job satisfaction, chi-square test is worked out by using the following formula:

\[ \chi^2 = \sum \left( \frac{(f_o - f_e)^2}{f_e} \right) \]

where

\[ \chi^2 = \text{Chi-square} \]
\[ f_o = \text{Observed frequency} \]
\[ f_e = \text{Estimated frequency} \]

Degree of Freedom (d.f.)

\[ \text{d.f.} = (r - 1) (c - 1) \]

where

\[ r = \text{No. of Rows} \]
\[ c = \text{No. of Columns} \]

The Cobb-Douglas production function has been used to find out the labourer's productivity in the building industry.

The formula of Cobb-Douglas Production Function used in this study is given below:

\[ \log f = \log a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 \quad \quad R^2 \]

where

\[ f = \text{Value of output (I)} \]
\[ X_1 = \text{Material (value in Rs.)} \]
\[ X_2 = \text{Human Labour (value in Rs.)} \]
\[ X_3 = \text{Fixed Capital (value in Rs.)} \]
\[ A = \text{Constant (intercept term)} \]

\[ b_1 \text{ to } b_3 \quad \text{Elasticity Coefficients of respective inputs} \]
\[ R^2 = \text{Coefficient of Determination} \]