

An Empirical Analysis of Lewis Model in Gujarat

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Abstract

This study attempts to explore the trends and patterns of employment in Gujarat labour market, particularly workers from agricultural to construction sector. High labour supply and the concomitant decrease in rural labour surplus and upward pressure on wages match the characteristics of the Lewis model (1954) which analyses the relationship between labour supply and wage changes. Therefore, this paper analysis “Whether Gujarat has reached its Lewis Turning Point (LPT) or no.? For the data collection, the main priority has been assigned to primary research materials with 348 samples from four cities of Gujarat, from Ahmedabad, Mehsana, Rajkot and Surat. It empirically assesses, at which stage Gujarat economy is reaching as per the three stages of Lewis model including Lewis turning point. The paper finds that until 2015-16, Surplus labour in rural Gujarat is in decline, and there is a concomitant rise in marginal product and demand of workers, which increased the wages in both sectors; so Gujarat is probably in the 3rd (third) stage of the Lewis model now. In the near future Gujarat could face labour shortage in rural area with the current trend of migration and expansion of both rural and urban sectors. The paper concludes that sustainability of economic growth in Gujarat requires an upgrading of labour market to accommodate the merging of the agriculture and construction sector.

Keywords: *Lewis Model, Lewis turning point, wage rate, Gujarat*

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Introduction

In a dual-sector economy, its emergence has been accelerated by two factors. One is a demographic transition that has slowed down labour supply, which had earlier increased massively in India. The other is fast growth of the economy, particularly in construction, which sustains strong labour demand. In Gujarat, agriculture sector made a negative contribution to increase in jobs, whereas construction sector is playing a significant role in creation of employment. Majority of rural workers are moving towards urban sector. The Lewis model (1954) predicts that as economic growth takes off, workers' wages will be stable for a period and labour will move from the agricultural sector to the industrial sector. At a certain point (called the Lewis turning point, or LTP), the labour surplus in the rural agricultural sector will be depleted, but demand in the urban industrial sector will continue. This will lead to a sharp increase in wages. For the labour market in India, the Lewis model can be tested by estimating the change in the dynamic relationship between supply and demand. Alternatively, it can be tested by considering wage rate equal to marginal product of labour; marginal productivity theory says wage is determined by the marginal product of labour. Higher the physical productivity, higher is the worker's wage.

Informal sector has a remarkable capacity to provide jobs and supply primarily the poorest part of the population with basic goods and services. Informal sector has out-stripped the formal sector in terms of numbers employed and shows a good prospect for further growth. Unorganized/Informal sector comprises 92 per cent of total workforce wherein about 50 percent of them are construction workers (Neff et al. 2012). NSSO rounds suggest that growth rate of employment during the first decade of the 21st century, turns out to be only 1.5 percent, showing a long term—deceleration, with the highest GDP growth of 7.5 percent, the highest in any short or long period before (Papola 2012). The owing for slow growth rate of employment is that agriculture and manufacturing sectors made negative contributions to the increase in employment, whereas among the sub-sectors of the industrial sector, only construction plays a vital role in Indian labour market during this period (Papola 2012; Behera 2012; Himanshu 2011; Jatav et al. 2012). It is also noted that workers who live in rural area find the agricultural sector with surplus of labour and low wages and seasonal demand for labour

deprives them from regular earnings. As a result, they are forced to move temporarily to work in construction sector to meet the dire needs of the family (Madhok 2005).

In terms of employment, construction worker is not only the principle category of workers in unorganized sector, but also the 2nd largest, next only to agriculture, employer in the country (Soundararajan 2013). According to Planning Commission, the numbers of construction workers were 17.54 million in 1999-00 and 26.02 million in 2004-05. Further, 44.04 million in 2009-10 and it is projected to 92 million people till 2022. Thus almost 50 million jobs would be created by this industry, in next 10-12 years. According to the National Sample Survey Organisation (NSSO) estimates, about 5.57 percent of workers were engaged in building and other construction sectors in 2004–2005 (Government of India 2007). In 2012, it constituted direct/indirect employment to nearly 31 million personnel, employing up to 18 million personnel directly and up to 14 million personnel indirectly and is expected to employ 92 million by 2022 (Planning Commission 2011). Through field study, the article examines if the migration of labour to an urban space has made any significant change in their socio-economic, living and working conditions.

The construction industry in India is the second largest employer, next only to agriculture. The sector employs more than 35 million people and approximately 3 million construction workers are added every year in India. The sector is labour-intensive and, including indirect jobs, provides employment to around 33 million people. It is estimated that about 70 per cent of these are employed in the infrastructure construction and remaining 30 per cent in the residential construction. According to industry estimates, the industry is expected to generate additional employment of 47 million, with the total number of persons employed in the sector reaching 83 millions by 2022 (Indian Construction Industry at a Glance in 2015-16).

All evidence suggests that Construction has been the fastest growing and emerging sector, in India as well as in Gujarat, even insofar as the employment of unskilled and casual workers is concerned. However, the recent changing pattern of employment from agriculture sector to construction sector was prevailing in Indian labour market due to excess of labour and low wages in agricultural sector. Therefore, this study tries to find out the applicability of famous Lewis Model as a framework for examining whether Gujarat

has reached Lewis Turning Point or. What is the pull and push factor for mobility of workers from agriculture to construction sector? There is hardly any study in Gujarat which identifies the participation and discrimination, which prevent women workers in construction sector to acquire skilled employment and the process by which these women could be empowered in this sector.

Research Methodology

The study is based on the mixture of both primary and secondary data. The major sources of secondary data used Government of Gujarat, published books, articles from scholarly journals, and online information etc. The main priority would be assigned to primary research materials. Some strategies would be adopted to collect quantitative and qualitative data. In this part, the following research methods have been discussed: research design, sample design, methods/tools/techniques of data collection and data analysis.

Research design

This is an empirical study which is mainly based on field survey. In order to collect primary micro level data, a survey was conducted in the four cities of Gujarat. The State is situated in the western coast of India region and which has received a huge amount of the migrant population in construction industry from the rest of the country during the first decade of 21st century. To identify dynamics of employment between rural agricultural sector and urban construction areas and wage rates in labour markets, an empirical study was made in urban areas. Since, size of construction workers in informal urban sector is unknown; it is not possible to decide in the statistical sense how random our sampling was. However, our sampling was random in the sense that workers were selected randomly at their places of work, in the places they were living (besides construction site) and labour chowk where workers wait for contractors/employers. The selection of construction site was also random, because most of the workers refused to provide information at construction site.

Sample Design

This study has been selected with one city from each region/mandal of Gujarat on the basis of geographical location and construction growth and development, etc. Thus, four cities/talukas have been selected namely, Ahmadabad city/taluka from Central Gujarat, Mehsana city/taluka from North Gujarat, Surat city/taluka from South Gujarat and Rajkot city/taluka from Saurashtra and Kachchh Mandal of the State. For conducting the survey, ten to twelve construction sites would be selected purposefully based on their construction work and progress from each city. Finally 134, 31, 74 and 109 respondents from each of the four cities will be selected for making a total of 382 respondents, respectively. The duration of data collection was 20th July, 2015 to 28th January, 2016 and samples of workers were drawn from urban city centre and attempt was made to interview respondents who had come from agricultural background.

Table 1: Sample Selection Criteria in Cities of Gujarat

Region/Mandal	Urban Agglomeration/ City	Main Workers	Weight	Necessary Sample Size	Primary Survey	Weight for Primary Survey
North Gujarat	Ahmedabad	1956236	0.46	162.54	134	0.39
Central Gujarat	Mehsana	52831	0.012	4.38	31	0.09
South Gujarat	Rajkot	441643	0.11	36.69	74	0.21
Saurashtra and Kachchh	Surat	1737481	0.42	144.36	109	0.31
Total		4188191	1	348	348	1

Source: Census of India, 2011

A perusal of the table 1.1 reveals that necessary sample size should be 162, 4, 36 and 144 samples from Ahmedabad, Mehsana, Rajkot and Surat, respectively. However, sample size in Mehsana is 4, which is very less or negligible. Therefore, the study has increased the

sample size from 4 to 31 respondents in the Mehsana city. Again, sample size in Rajkot should be 36, which is also very less. As Rajkot belongs to Saurashtra and Kutch region and this region represents maximum number of cities included Jamnagar, Junagarh and Bhavnagar city, where construction work is going on rapidly and covers the highest land area in Gujarat. Therefore, this sample size could not represent entire Saurashtra and Kutch region. Hence, the study has increased sample size from 36 to 74 respondents in the Rajkot city. Further, the study has chosen 134 samples from Ahmedabad city and 109 samples from Surat City. The study has decreased sample size in these cities, because sample size in Rajkot and Mehsana has increased. Finally, on the basis of weight value, 134, 31, 74 and 109 samples has selected from Ahmedabad, Mehsana, Rajkot and Surat, respectively.

Methods/Tools/Strategies of Data Collection

Cross sectional analysis is being carried out in this study. The method of data collection would be chosen for the study is quantitative and qualitative data. Structured schedule would be prepared with open/ended questions. Stratified Random Sampling method would be used to choose the respondents in each construction site. Direct personal interview and focus group discussion (FGD) would be adopted to collect the data from respondents. Finally, the statistical tools employed would be mean, mode, standard deviation, etc.

Survey Modules

Survey questionnaire was designed on the basic of the framework of the pilot/M. Phil survey conducted by me in the year 2012 and was customised further to incorporate more variables so as to capture the characteristics of construction workers learned from the previous survey. The objective was to create a rich data set on the economic behavior of construction workers to establish its links to better policymaking. Therefore, the questionnaire was designed to capture information at the individual level. The questionnaire provided information on demographic-social profile (such as age, sex, social group, educational attainment, etc.) as also took migration and employment details (nature and description of employment, supply for and demand of labour in construction, etc.), land holdings of respondent and daily wage rate in the agricultural position and daily as well as monthly and yearly income in the construction sector, role of informal and formal networks and contract system in construction.

Area of the Study

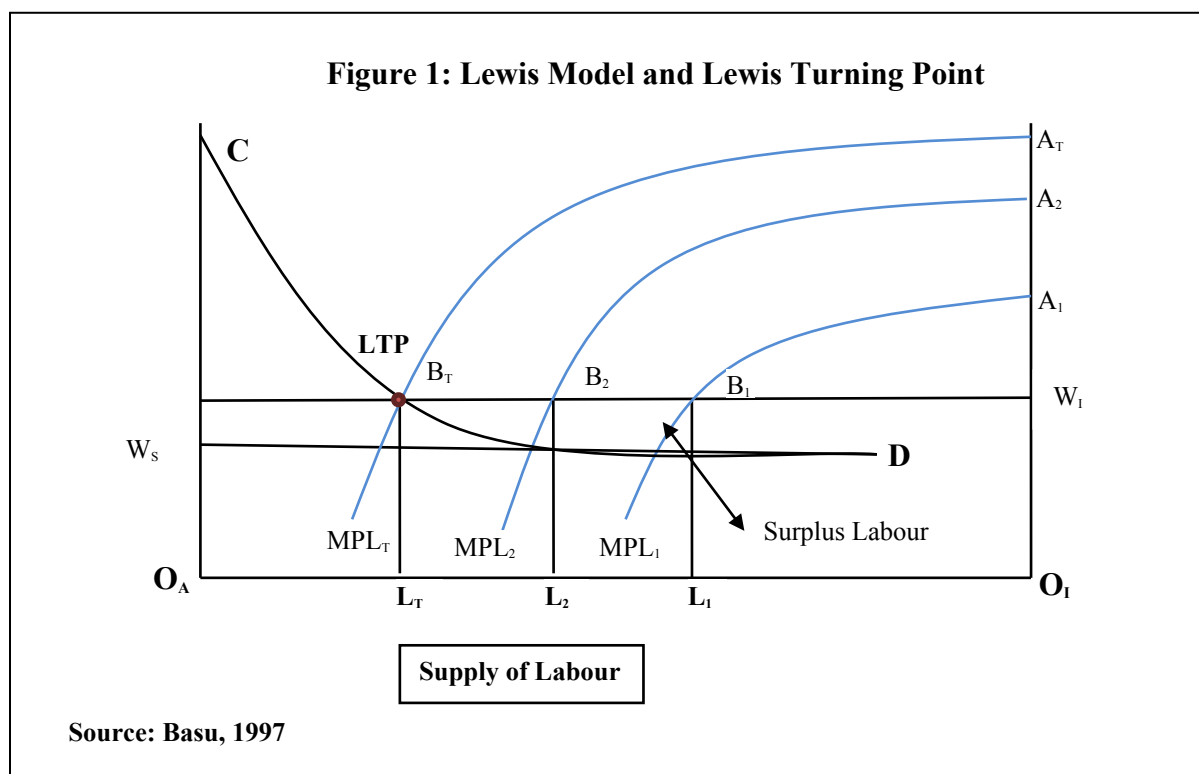
Four districts were selected for the purpose of the study. The districts selected were Ahmedabad as the industrial capital of the State, Surat as the district in which construction activities take place on a mass scale, Rajkot as the district where the people spent a major portion of their earnings from Europe countries on construction activities and Mehsana as the district having the least construction activities and the lowest number of construction workers. Purposeful sampling technique was used and sample size was decided under proportional allocation method. Even though the Board classified the workers under 26 categories, for the purpose of this study, the sample have been classified into 7 categories like Masons, Carpenters, R.C.C. workers, Wiremen, Painters, Helpers and others. The criteria adopted for a construction worker to be included in the sample selection were the following: he/she should be employed for doing any work in connection with building construction, including residential, industrial, and commercial projects and any work relating to the supply of building materials, and who gets his/her wages directly or indirectly from an employer or contractor/sub-contractor.

Ordinary Least Squares and Two Stage Least Square Methods

The ordinary least squares method was used to compute the estimation of parameters. It is one of the oldest techniques of modern statistics, it was first published in 1805 by the French mathematician Legendre but the famous German mathematician Gauss, claimed to have used it as early as 1795. Galton used the technique in 1886 in his work on the heritability of size which laid the foundations for correlation and regression analysis. Both Pearson and Fisher used and developed it in different contexts (factor analysis for Pearson and experimental design for fisher). Today, the least squares method is widely used to find or estimate the numerical values of parameters to fit a function to a set of data and to characterise the statistical properties of estimates. It exists with several variations; and its simpler version is the called Ordinary Least Squares (OLS).

Lewis Model

Sir William Arthur Lewis was propounded the economic development model of “Unlimited Supplies of Labour” in 1954 and empirically implemented by himself in 1972, which provides a significant contribution for economies with surplus labour and scarce resources. This conceptual framework offers some insight into the investigation of the LTPs. The three stages of economic development under Lewis model are presented diagrammatically in Figure 1.



Stage 1: Surplus labour is drawing down from agriculture to industry sector and marginal product of labour in agriculture remains zero or close to zero. This is not affecting the agricultural output and wage. The Wage determinate equals average (not marginal) product of labour in agriculture, while Industrial wage is based on marginal product of labour (MPL). Workers move from agriculture to industry at a rate determined by new industrial investment (Mookherjee, 2014; Ranis and Fei, 1961). The wage gap between rural agriculture and urban sector increases in this period.

Stage 2: This stage starts when surplus labour in rural sector declines and MPL_a becomes positive in agricultural sector. Wage continues to be W_a in rural sector and continues as long as remains below MPL_i . There is surplus labour in rural area and labour scarcity yet in urban sector. As a result, wage rises that workers must be paid in urban areas. There is scarcity of workers in some regions of countryside. As a result, the scarcity of labour compels rural agriculture sector to compete for workers and wage rate of workers commences to rise in agriculture. Stage 2 ends when $MPL_a = W_a$ and labour scarcity in country countryside. Agriculture becomes commercialized and farms hire workers on the market (Mookherjee, 2014; Ranis and Fei, 1961).

Stage 3: Agricultural wage W_a now starts rising owing to growing labour scarcity. As a result, wage raises in both sectors, but rural wage increases higher than urban wage. This is because raises wage that workers must be paid in urban areas, reducing capital profits. Then capitalist hires few workers. Consequently, wage in urban sector increases and tends to close to each other. Stage 3 ends when $MPL_a = MPL_i$ and labour scarcity in country as a whole. This is point where economy has reached famous Lewis Turning Point. Economy is now modern and mature and no spatial misallocation any more. Solow model works from now onwards (Mookherjee, 2014; Ranis and Fei, 1961).

Daily Wages Rate

Earning is an important factor for analysis of economic background of an individual. Daily wage is a significant composition of socio-economic status of people in the society. It can improve health, educational attainment and living standard of the workers. Daily wage

rate is determined according to the nature of employment, such as unskilled, skilled, semi-skilled and highly skilled category. From the field survey, it is found that the average daily wage is not sufficient for unskilled workers family to lead a decent life in the city. They cannot afford costly education and health services properly in the city. However, the economic condition of workers has slightly improved, but there is an opportunity to improve their earnings and living standards to become skilled workers. Majority of workers worked to work around 8-10 hours per day, which shows that they are paid even less the minimum wages. Further, female workers, who even treated at the marginal end of the skilling pyramid usually face more discrimination in wages. The earnings of the respondents from their employment are given in **Table 2**.

Table 2: Daily Wage Rate in Agriculture and Construction Sector of Gujarat by city wise

Sr. No.	Daily Wage Rate (Rs.)	Ahmedabad	Mehsana	Rajkot	Surat	Total	Daily Wage Rate (Rs.)	Ahmedabad	Mehsana	Rajkot	Surat	Total
1	60	0	0	0	1.83 (2)	0.57 (2)	150	3.73 (5)	0	2.7 (2)	3.67 (4)	3.16 (11)
2	70	3.73 (5)	0	1.35 (1)	12.84 (14)	5.75 (20)	180	2.24 (3)	0	0	1.83 (2)	1.44 (5)
3	80	2.99 (4)	0	2.7 (2)	15.6 (17)	6.61 (23)	200	4.48 (6)	6.45 (2)	4.05 (3)	19.27 (21)	9.2 (32)
4	100	29.85 (40)	35.48 (11)	56.76 (42)	39.45 (43)	39.08 (136)	215	0.75 (1)	0	0	0	0.29 (1)
5	120	8.21 (11)	0	1.35 (1)	10.09 (11)	6.61 (23)	220	11.19 (15)	0	13.51 (10)	0.92 (1)	7.47 (26)
6	125	0	32.26 (10)	5.41 (4)	9.17 (10)	6.9 (24)	225	0.75 (1)	0	0	0.92 (1)	0.57 (2)
7	130	0.75 (1)	0	1.35 (1)	0	0.57 (2)	230	3.73 (5)	0	4.05 (3)	0	2.3 (8)
8	150	3.73 (5)	22.58 (7)	12.16 (9)	5.5 (6)	7.76 (27)	250	8.21 (11)	25.81 (8)	20.27 (15)	14.68 (16)	14.37 (50)
9	180	0	3.23 (1)	0	0	0.29 (1)	270	0	3.23 (1)	0	0	0.29 (1)
10	200	47.01 (63)	6.45 (2)	14.86 (11)	5.5 (6)	23.56 (82)	300	20.9 (28)	16.13 (5)	6.76 (5)	27.52 (30)	19.54 (68)
11	250	0	0	1.35 (1)	0	0.29 (1)	350	22.39 (30)	6.45 (2)	5.41 (4)	4.59 (5)	11.78 (41)
12	300	2.24 (3)	0	0	0	0.86 (3)	400	5.22 (7)	12.9 (4)	9.46 (7)	16.51 (4)	10.34 (36)
13	350	1.49 (2)	0	0	0	0.57 (2)	410	0.75 (1)	0	0	0	0.29 (1)
14	400	0	0	2.7 (2)	0	0.57 (2)	450	0	6.45 (2)	0	2.75 (3)	1.44 (5)
15	Total	100 (134)	100 (31)	100 (74)	100 (109)	100 (348)	500	2.24 (3)	16.13 (5)	16.22 (12)	2.75 (3)	6.61 (23)
16							550	0	0	1.35 (1)	0	0.29 (1)
17							600	13.43 (18)	3.23 (1)	2.7 (2)	4.59 (5)	7.47 (26)
18							650	0	3.23 (1)	0	0	0.29 (1)
19							700	0	0	13.51 (10)	0	2.87 (10)
Total								100 (134)	100 (31)	100 (74)	100 (109)	100 (348)

Source: Based on Primary Survey, 2015-16

A perusal from table reveals that nearly 51 per cent (181 persons) were receiving Rs. 100 or less wages per day in agriculture, while very few workers nearly 2 per cent (8 persons) were receiving more than Rs. 200 per day, they belongs to only Rajkot (1.35 per cent or 1 person) and remaining (3.73 per cent or 5 person) belongs to Ahmedabad city. Remaining nearly 47 per cent (198 persons) workers were receiving wages between Rs. 100 to 200per day in agriculture sector. This shows that agriculture workers were working at very fewer wages. Most of them belonged to unskilled category they joined construction such as fitter worker and worker who loaded bricks, mixed cement, sand, lime, etc. In construction sector, very few nearly 4.60 per cent (16 persons) were receiving less than Rs. 200per day, while majority of workers were receiving more than Rs. 200 to 400 per day,wherein most of them belonged to semi-skilled category, such as carpenters, painters, dumper drivers, electricians and others. Only nearly 10.5 per cent (37 persons) were receiving Rs. 600 and more per day, where in most of them belong to highly skilled category such as tile-mosaic workers. They belong to Ahmadabad, Surat, Rajkot, and Mehsana, which accounted 13.43 per cent (18 persons), 4.59 per cent (5 persons), 2.7 per cent (2 persons) and 3.23 per cent (1 person), respectively. It is not wrong to say that agriculture workers are receiving one of the lowest wages, while construction workers were receiving one of the highest wages in unorganized sector. The wage rates existing in the construction sector are one of the highest in the unorganised sector (John, 2002). The study suggests that agricultural workers should migrate to urban construction sector during lean period. It can increase their income and decrease surplus labour in India labour market.

Information about overtime and other incentives, such as provident fund (PF), bonus and dearness allowances (DA), was collected during the study. 100 per cent of the workers were willing to work extra time with wages. Out of the total, only 3 per cent workers were not receiving overtime wages, remaining 97 per cent were receiving extra wages. They were receiving overtime wage of nearly ₹23 per hour or double. If we can talk about the other incentives except wages, out of the total, only 16 per cent construction workers were receiving PF which was given by reputed construction companies, such as Tata Consultancy and L&T Limited. Tata Consultancy Project provides PF of ₹500 per month only to few workers of the company. The remaining 84 per cent were not receiving any other benefits. In the context of the

crucial issue of inequality of wages/earnings of construction workers, this study clearly points out that there is no wage disparity between male and female migrant construction workers.

The study also collected information on monthly expenditure of migrant workers. Majority of them spent their income on only food and related items during the construction work. A large number of construction workers pointed out that they purchased food items daily without any expenditure plan. Food is simple and unvarnished due to limited means. Simple meals consist mainly of rotis and either dal or a vegetable cooked either in the form of a curry or in the dry form. Most of them eat three times a day.

Das (1992) revealed that the labour contractor raises money from the principal employer and disburses wages on a day to day work or a piece-rate work basis. Some among the skilled groups are also paid on a monthly or fortnightly basis. According to the 1979 study on a construction industry at Ahmadabad the sector is characterized by a rather low wage rate. The study records that “the average of wage rate prevailed in the building construction activity is around Rs.9 per day. The skilled workers are paid an average wage rate of Rs.10 per day; the unskilled workers Rs.6 and the Rs.8 of the semi-skilled workers wage falls in between but closer to the average wage rate of skilled worker”.

Descriptive Statistical Analysis of Key Socio-Economic Variables

Good socio-economic conditions to workers in any country encourage them to work more productively and contribute in the process of development. The average hours of working in a day was around 8 to 9 hours with 30 minutes to 1 hour rest after 4 to 5 hours of works as a lunch time. Majority of workers mentioned that working hours is satisfactory. An analysis of satisfactory level of working-living conditions of workers has been done through statistical analysis. Table reveals that across the top row are the requested statistics of N (No. of Respondents), minimum (lowest), maximum (highest), mean (average) and standard deviation (S.D.). Note, for Valid N (list wise) only includes the respondents with no missing data on any variable requested in the output.

Table 3: Summary of Statistics for Key Variables

Sr. No.	Socio-Economic Indicator	Sample Size	Mean	S. D.	Minimum	Maximum
1	age	348	30.20115	8.72142	18	67
2	Household size	348	4.62069	2.083233	1	12
3	Male	348	0.1954023	0.397081	0	1
4	Sector	348	0.158046	0.3653094	0	1
5	Hindu	348	0.8908046	0.3123333	0	1
6	Married	348	0.7816092	0.4137489	0	1
7	ST	348	0.2701149	0.4446583	0	1
8	SC	348	0.2356322	0.4250044	0	1
9	OBC	348	0.4281609	0.4955247	0	1
10	GEN	348	0.066092	0.2488005	0	1
12	Family Profile	348	0.6982759	0.4596671	0	1
13	Illiteracy	348	0.316092	0.4656188	0	1
14	Primary	348	0.2902299	0.4545219	0	1
15	Middle	348	0.1925287	0.3948537	0	1
	Secondary	348	0.123563	0.329556	0	1

16			2	4		
17	Above Secondary	348	0.077586 2	0.267904 5	0	1
18	Unskilled	348	0.548850 6	0.498324 4	0	1
19	Skilled	348	0.140804 6	0.348320 7	0	1
20	Semi-Skilled	348	0.310344 8	0.463300 9	0	1
22	Network 1	348	0.215517 2	0.411772 7	0	1
23	Network 2	348	0.106321 8	0.308692 9	0	1
24	Network 3	348	0.025862 1	0.158952 3	0	1
25	Self-Initiate	348	0.482758 6	0.500422 2	0	1
26	Contractor helps find job	348	0.836206 9	0.370620 6	0	1
27	Move without job	251	0.972111 6	0.164982 2	0	1

Source: Based on Primary Survey, 2015-16

(1)& (2) A perusal of the table reveals that the mean of age is 30.20, which indicates that average age of workers is 30.2 years and the mean of household size is 4.62, which indicates that average family size of workers is 4.62. These two variables consist actual value.

(3) the mean of family profile is .69, which indicates that 69 per cent of the workers was coded as 1(No) i.e. 69 per cent construction workers was belonged to joint family, and remaining 31 per cent of the workers was coded 0 (Yes) i.e. 31 per cent workers was belonged to nuclear family.

(4) the mean of sector is .15, which indicates that 15 per cent of the workers was coded as 1(No) i.e. 15 per cent construction workers was belonged to urban area, and remaining 85 per cent of the workers was coded 0 (Yes) i.e. 85 per cent workers are belonged to rural area.

(3) the mean of religion profile is .89, which indicates that 89 per cent of the workers was coded as 1(No) i.e. 89 per cent construction workers was belonged to Hindu, and remaining 11 per cent

of the workers was coded 0 (Yes) i.e. 11 per cent workers was belonged to non-Hindu such as Muslim, Christian, Buddhist, etc.

(3) the mean of family profile is .69, which indicates that 69 per cent of the workers was coded as 1(No) i.e. 69 per cent construction workers was belonged to joint family, and remaining 31 per cent of the workers was coded 0 (Yes) i.e. 31 per cent workers was belonged to nuclear family.

(3) the mean of marriedis .78, which indicates that 78 per cent of the workers was coded as 1(No) i.e. 78 per cent construction workers was married or separated, and remaining 32 per cent of the workers was coded 0 (Yes) i.e. 32 per cent workers was unmarried.

(II) The social group such as ST, SC, OBC and general were constructed as dummy variable such as ST were coded as 1 and remaining others were coded as 0, SC were coded as 1 and remaining others were coded as 0, OBC were coded as 1 and remaining others were coded as 0, and general were coded as 1 and remaining others were coded as 0. Thus mean value of ST, SC, OBC and general are (coded as 1).27, .23, .48 and .67 respectively, which indicates that 27 per cent, 23 per cent, 48 per cent and .7 per cent were belonged to ST, SC, OBC and general, respectively.

(II) The educational attainment such as illiterate, educated up to primary, middle, secondary and above to secondary were constructed as dummy variable such as illiterate were coded as 1 and remaining others were coded as 0, educated up to primary were coded as 1 and remaining others were coded as 0, educated middle were coded as 1 and remaining others were coded as 0, educated middle were coded as 1 and remaining others were coded as 0, educated secondary were coded as 1 and remaining others were coded as 0 and above to secondary were coded as 1 and remaining others were coded as 0. Thus mean value of as illiterate, educated up to primary, middle, secondary and above to secondary are (coded as 1) .32, .29, .19, .12 and .08 respectively,

which indicates that 32 per cent, 29 per cent, 19 per cent, 12 per cent and .8 per cent were illiterate, educated up to primary, middle, secondary and above to secondary, respectively.

The activity status such as unskilled, semi-skilled and skilled were constructed as dummy variable such as unskilled were coded as 1 and remaining others were coded as 0, semi-skilled were coded as 1 and remaining others were coded as 0, and skilled were coded as 1 and remaining others were coded as 0. Thus mean value of unskilled, semi-skilled and skilled are (coded as 1) .54, .14 and .32 respectively, which indicates that 54 per cent, 14 per cent and .32 per cent were belonged to unskilled, semi-skilled and skilled activity status, respectively.

The social group such as ST, SC, OBC and general were constructed as dummy variable such as ST were coded as 1 and remaining others were coded as 0, SC were coded as 1 and remaining others were coded as 0, OBC were coded as 1 and remaining others were coded as 0, and general were coded as 1 and remaining others were coded as 0. Thus mean value of ST, SC, OBC and general are (coded as 1) .27, .23, .48 and .67 respectively, which indicates that 27 per cent, 23 per cent, 48 per cent and .7 per cent were belonged to ST, SC, OBC and general, respectively.

Regression Analysis

The estimated equation is based on Mincerian equation which is conventionally applied in the field of labour economics. The natural logarithm of daily Wages in construction sector is given as

$$\ln W_c = \beta_0 + \beta_1 W_A + \beta_2 \text{Age} + \beta_3 \text{Age}^2 + \beta_4 \text{Experience} + \beta_5 \text{Gender} + \beta_6 \text{Category} + \beta_7 \text{Educational Attainment} + \beta_8 \text{Religion} + \beta_9 \text{Nature of Employment} + e$$

Dependent Variable

W_c = Logged daily wage rate in Construction Sector

Dependent Variable

W_A = Logged daily wage rate in Agriculture Sector

Age = Age of Respondent

Age_square = Square of age

Exp_cst = Experience in construction sector

Gender Profile

d_male=1 if the respondent is male, = 0 otherwise

(Male is taken as the reference category for gender profile)

Religious Profile

d_hindu=1 if the respondent is Hindu, = 0 otherwise

(Hindu is taken as the reference category for religious profile)

Social Category

d_st= 1 if the respondent is schedule tribe, = 0 otherwise

d_sc= 1 if the respondent is schedule caste, = 0 otherwise

d_obc= 1 if the respondent is other backward caste, = 0 otherwise

d_gen=1 if the respondent is general caste, = 0 otherwise

(SC is taken as the reference category for social group)

Educational Attainment

d_illi= 1 if the respondent is illiterate, = 0 otherwise

d_prim_mdrs= 1 if the respondent is educated below primary or madarsa, = 0 otherwise

d_a_pri_b_sec = 1 if the respondent is above primary or below secondary, = 0 otherwise

d_a_sec= 1 if the respondent is educated above secondary, = 0 otherwise

(d_illi is taken as reference category for educational attainment)

Nature of Employment

d_unskilled=1 if the respondent is unskilled, = 0 otherwise

d_semi_skilled=1 if the respondent is semi skilled, = 0 otherwise

d_skilled=1 if the respondent is skilled, = 0 otherwise

(d_unskilled is taken as reference category for nature of employment)

Migration

d_city_destination, (workers' origin and destination place are same.)

d_ru_migration, (workers belong to rural area of Gujarat as well as rest of the country)

d_ur_migration, (workers belong to urban area, excluding destination place)

Table 4: Determinants of Mincerian Regression Analysis

Dependent Variable: Logged Daily Wage in Construction		
Variables	Coefficient	(Standard Error)
ln_ag_wage	0.409594***	(0.0445359)
age	0.010575	(0.0102119)
age_square	-0.00013	(0.0001466)
dum_gdr	-0.09739**	(0.0407882)
d_gen	-0.02238	(0.0640056)
d_obc	-0.03557	(0.0362419)
d_sc	-0.1159***	(0.0403553)
d_prim	0.101664**	(0.0397493)
d_middle	0.118461***	(0.0439895)
d_secon	0.083995*	(0.0502753)
d_ab_sec	0.043143	(0.0591114)
d_skilled	0.458796***	(0.0458322)

d_semi_skilled	0.234179***	(0.0370634)
d_ru_migration	-0.25797***	(0.0457099)
d_ur_migration	-0.33444***	(0.0880984)
cons	3.672269***	(0.2773776)
No. of Observation	348	
Pro>F	0	
R-squared	.5375	
Adj R-squared	.5166	

Source: Author's Calculation

Note: Standard error is in parentheses. Significance level at 10% is denoted by *, 5%**, and 1%***

Reference category: d_sc, d_primary, d_unskilled, d_illiterate, d_ur_natives, d_gdr=female=1,

Regression Result

A perusal of table reveals that daily wages in agriculture, gender, category, education, nature of employment, and rural-urban migration levels are significantly influence the daily wage rate in construction. The regression result from primary survey data reveals that the wage rate in agriculture has significance impact on wage rate in construction. It shows that 1 per cent change in agricultural wage will increment in 41 per cent in construction wage. We get expected sign for the coefficient of age (positive) implying the probability of daily wages increases in with age within the age group of 15-59. The expected sign of age square (-), which postulate that with age workers gather experience that in turn enhances their productivity, and consequently their chance to get higher wages. But age and age square do not significant. The gender dummy represents 1 for females and 0 for males, which reveals highly significant. Given the existing economic structure in society, female workers are receiving fewer wages as compare to male workers in construction.

The household size of workers is significantly influence on daily wages in construction. Further, the results also suggest that compared to the workers belonging to STs, SCs are significantly receiving lower wages in construction. ST construction workers are receiving more wages as compare to SC workers. This is because majority of ST workers belong to Dahod district of Gujarat. They are local workers and works on higher wage as compare to SCs migrants. Nevertheless, compared to STs, the wages of OBCs and General are not significantly different in

construction. Married workers are receiving more wage than unmarried workers and widow are receiving fewer wages than that.

Another important determination of daily wage rate is education. After collapsing the detailed information collected on the educational status of individuals, three education categories have been considered, illiterate, up to primary, middle, secondary and above secondary. Two dummy are included, illiterates are taken as the comparison group. Illiterate workers are receiving fewer wages as compare to educated workers, however only primary and middle workers variables are significant. Again, compared to illiterate workers, primary, middle and secondary (9th class) educated workers are significantly receiving more wages in construction.

Again, skills are most important indicators of wage determination in construction. Three dummies variable is constructed, unskilled are taken as the comparison group. compared to unskilled workers, semi-skilled and skilled workers are significantly receiving more wages in construction. There is a tendency of labour shifting to better jobs after migration, though it is not widely prevalent phenomenon. Particularly in terms of secondary occupations, the changes after migration are not perceptible. As the category of no-agricultural labour (which includes better outcomes, as some individuals were unemployed before migration (Mitra and Pradhan, 2016).

Conclusion

The study concludes that there is no surplus labour in rural Gujarat, while there is little bit surplus labour in the urban sector of Gujarat. As a result, rural sector is experiencing shortage of labour. It should be borne in mind that population is huge and that there is still a substantial labour surplus, which could be transferred between rural and urban industries. However, the labour shortage is a structural problem in rural area and India has an irrational structure, and at the same time there is a shortage of workers.

According to the analytical results, the Indian economy is just entering the second stage of the Lewis model, as surplus labour constrains wages from increasing. Construction sector wages have increased, and probably exceed agricultural wages. The percentage change is either the same, or higher in urban construction. In rural India, marginal productivity of labour is increasing, and probably exceeds average product of labour, but has not yet reached market wage. In other words, the labour market in rural India is not fully commercialised yet. Surplus

labour declined in absolute terms between 2004–05 and 2011–12. This supports the argument that India is approaching the LTP.

Whereas workers who worked in traditional manufacturing industries used to be young workers like construction, such young workers are now in shorter supply. Middle and old aged workers tend to return home, as they are unwilling to work in the manufacturing industry for low wages and poor. If the labour force still in the labour market could be attracted, and given suitable training, there would be no labour shortage problem, at least for the time being. (Wang, 2014)

The study concludes that there is no surplus labour in rural agricultural sector, while there is huge surplus labour in urban sector. As a result, rural sector is experiencing shortage of labour. It should be borne in mind that population is huge and that there is still a substantial labour surplus, which could be transferred between rural and urban industries. However, the labour shortage is a structural problem in rural area; India has an irrational structure, and at the same times a shortage of workers.

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