

**AN ANALYSIS OF THE STRUCTURAL COMPOSITION OF WORKFORCE IN
KERALA**

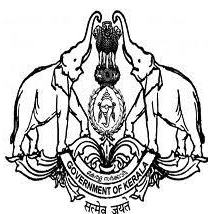
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By

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**KERALA STATE PLANNING BOARD
GOVERNMENT OF KERALA
December 2017**

DECLARATION

I hereby declare that this research report, titled “**An analysis of the structural transformation of workforce in Kerala**” is an authentic record of the research work carried out by me under the guidance of Dr. V.K Ramachandran; Vice Chairman, Kerala State Planning Board, for the Internship Programme 2017-18, Kerala State Planning Board. No part of it has been previously formed the basis for the award of any degree, diploma, associate ship, fellowship or any other similar title or recognition of any other University or Institution.

SHUBHAA BHATTACHARYYA

Thiruvananthapuram
December 2017

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AN ANALYSIS OF THE STRUCTURAL COMPOSITION OF WORKFORCE IN KERALA

-Shubhaa Bhattacharyya, Dr. V.K Ramachandran

JEL CLASSIFICATION

J 21, J 62, J 64

ABSTRACT

The objective of the paper is to provide an explanation of the sectoral composition of labour in Kerala by analysing unit level data from the National Sample Survey Organisation over the period 1983 to 2012. The paper aims to understand the distribution of workforce in various industries (categorised under the National Industrial Classification) and observe how such patterns have changed over the thirty year reference period, and to ascertain if the economy has undergone a structural shift in the workforce participation ratio, over the reference period.

INTRODUCTION

Kerala's story of economic growth is of interest to economists for its unique nature of transition from the 1980s to the late 2000s – Literature has referred it as a paradox of social development and economic backwardness.

In the 1980s, Kerala was a state that indicated high levels of social development but, a per capita income 16 per cent less than the national average. It also displayed an inability to stimulate economic growth.

Growth picked up in the 1990s. This was made possible by two emerging undercurrents which were, in turn, the consequence of Kerala's high levels of social development – demographic transition, and the uninterrupted international labour migration starting from the early 1970s which led to a high turnover. This was expected to create a virtuous cycle of development, referring to a trajectory of sustained growth path with human development under the influence of market oriented reforms and migrant remittance.

By the end of the first decade of 2000s, Kerala has a high level of per capita income over 34 percent of the national average, and high consumption expenditure relative to other Indian states. However, as per the Economic review of 2013, despite having a literacy rate of 93.93%, the state suffers from the highest rate of unemployment (7.4%, which is three times the national average of 2.3%) among all big states.

A concomitant outcome of such economic transition, often, is a structural change in the pattern of employment. Thus, a study into the labour dynamics becomes imperative, in order to ascertain if the same has occurred in Kerala, over the thirty year transition period beginning from the 1980s.

LITERATURE REVIEW

Economic development is regarded as a process that entails sustained increase in per capita output accompanied by structural change in productive capacities and employment – usually, a reallocation of the workforce from agriculture toward non-agricultural production and often, a migration from the rural to urban regions as industries tend to cluster in and around urban areas. Historical evidence from both advanced as well as growing economies in East and South Asia since 1960s suggests a negative association between growth in per capita GDP and the share of the workforce in the primary sector. An examination of the structural shift in India's labour from 1980s reveals, under no case approximates a Lewisian transformation where labour gradually turns into a scarce factor rather the whole process expands the structural 'reserve army of labour' in the Marxian sense with the only new element in it is that the reserve army is relatively more docile than ever (**Roy, 2008**).

Kannan (2005) makes an analysis of the structural transformation of the Kerala (and All-India) economy as seen through sectoral shares of income and employment – In Kerala, growth picked up in the 1990s, which was made possible by two emerging undercurrents which in turn were the consequence of the high level of social development – demographic transition; and the uninterrupted international labour migration starting from the early 1970s which led to a high turnover. (**Kannan, 2005; Chakraborty, 2005**). This has been referred to as the "virtuous cycle of development" in Kerala, referring to trajectory of sustained growth path with human development under the influence of market-oriented reforms and migrant remittances (**Rannis, 2000**)

However, several questions were raised about the nature and sustainability of the growth turnaround (**Oommen; Pillai and Shanta, 2005**) – A cursory analysis of the sectoral contribution reveals that the main drivers of economic growth have been the service and construction sectors, but contributions of industry and agriculture have been marginal. The largest stimulus comes from remittances of skilled workers working mostly in Arab countries, and there has been a high influx of unskilled migrant labourers, and the brevity of the problem of educated unemployment is challenging. Also, empirical analysis (based on the "Dutch disease" model, where the authors have also evaluated spending effects and real appreciation through trends in the sectoral growth and composition) has revealed the dampening effects that the 'resource movement' and the 'spending effects' have had on the goods producing sectors of the regional economy. (**Harilal and Joseph, 2003**) Kerala has clearly been unable to generate sufficient jobs for its indigenous skilled and literate population, causing a brain drain (however, the contribution of females in the workforce continues to be staggeringly low, probing questions into the mobility of women and workplace environment). Inequality has risen over the years, and high unemployment rates continue to prevail. (**Thomas, 2016**) Therefore, the challenge remains of translating its high human development status and relatively rapid growth into meaningful outcomes in employment and equitable participation of women (**Kannan, 2005**). Kerala's economy faces the problem of transferring native workforce from farm employment to non-farm employment (**Puthuma Joy**), and the economy continues to face a constant de-feminisation of labour (**Abraham, 2013**).

The paper aims to understand the structural composition of the workforce over the period of economic transition in Kerala from the 1980s to late 2000s, and determine how the allocation of labour has changed over various industrial divisions and sectors over the reference period, in order to ascertain the possibility and nature of a structural shift in employment.

METHODOLOGY

The paper studies unit level data as archived by the National Sample Survey Organisation over the period 1987 – 2011-12. The relevant NSSO rounds for Employment and Unemployment that have been considered are the 43rd round in 1987, 50th round in 1993-94, 55th round in 1999-2000, 61st round in July 2004, 64th round in 2007-08, 68th round in 2011-12.

In this study, we study the sample population's contribution to employment in the different sections of economic activities as per the National Industrial Classification, and extrapolate it with the use of multipliers, to evaluate the dynamics of the population.

By aggregating unit level data (at the individual level), we determine the percentage composition of workforce to the industrial divisions (Two digit classification) in a year, and then analyse the contribution of workforce to sections of the industry (one digit classification), and finally, we make an analysis of the workforce participation rate across the Primary, Secondary and Tertiary sectors.

This process is repeated over the relevant period, in order to examine if a structural shift in employment pattern has occurred over the time frame in reference.

The paper analyses the distribution of usually working persons (Principal Activity Status) by industry of work, using disaggregated (5 digit) NIC code structure, and graphically evaluates the percentage contribution of the workforce to the various sections of industry, and tabulates worker population ratio at the 2 digit level.

CONCEPTS AND DEFINITIONS

The workforce has been represented by the Usual Principal Activity Status, or UPS which reflects the status of an individual over a reference period of 365 days.

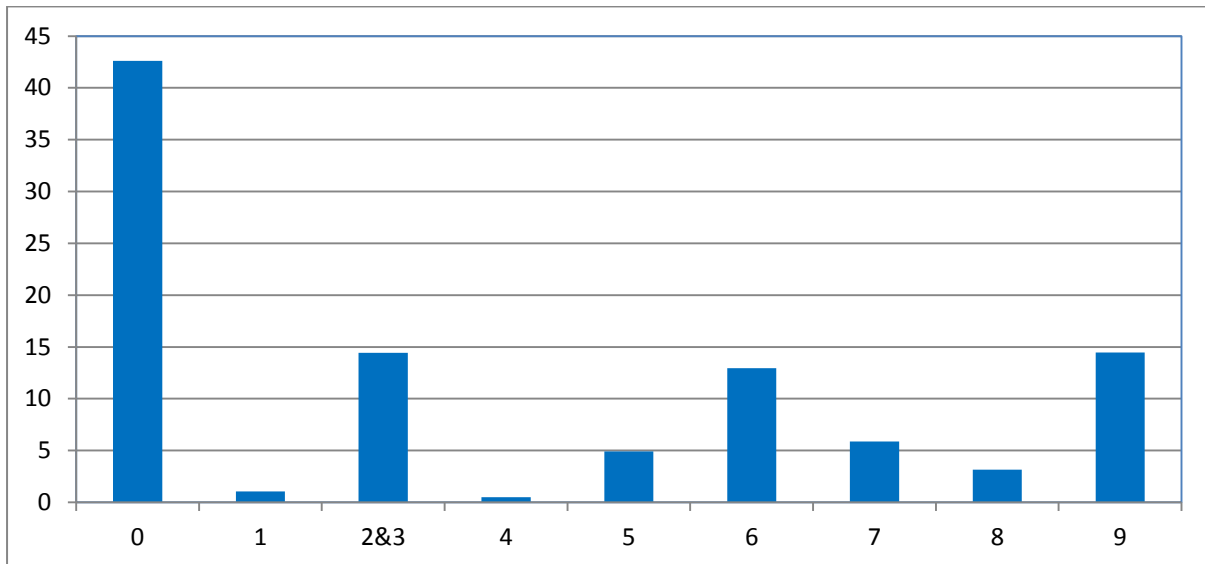
It is used for two purposes – To determine if a person is in or out of labour force, and to determine the employment (or unemployment) status of the individual in consideration.

A person is classified to be “belonging to the labour force”, if he/she has been employed or looking for employment for majority of the time in the reference period of one year preceding the survey. In the event of a tie, precedence is given to labour force participation.

In order to determine the employment or the unemployment status of the individual; the individual is considered to be employed if he/she was “employed”, i.e engaged in some gainful economic activity for the majority of the period when they were actively in the labour force (employed, or searching for employment.) and vice versa. Once again, priority is given to employment in the event of a tie.

DATA ANALYSIS, RESULTS AND INTERPRETATION

Graph 1.1 –Percentage contribution of the workforce to various industrial sections in Kerala in the year 1987



Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 43

The above graph illustrates the percentage contribution of the Workforce (measured through the Usual Principal Activity Status, or UPS) to the nine broad sections of industry, as designated by the NIC 1987 for Kerala, in the year 1987.

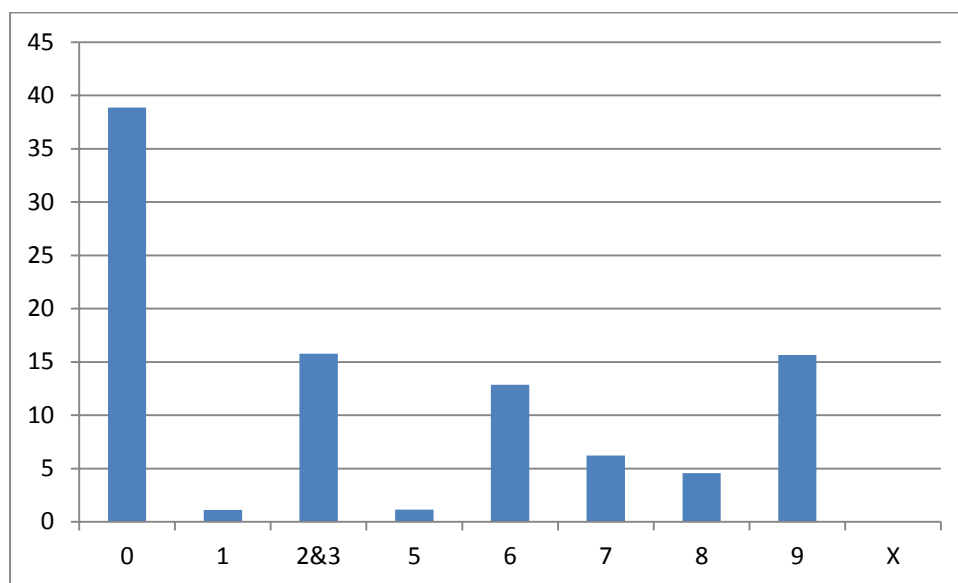
The X axis denotes the following sections:

Section code	Description of section code
0	Agriculture, hunting, forestry, fishing
1	Mining and quarrying
2&3	Manufacturing
4	Electricity, gas and water
5	Construction
6	Wholesale, retail trade, hotels & restaurants
7	Transport, storage, communications
8	Financing, insurance, real estate and business services
9	Community, social and personal services

The Y axis denotes the percentage contribution of the workforce (as reflected by the UPS), and the height of each column corresponding to a specific section of the industry, denotes the percentage contribution of Workforce to that industry.

From the graph, it can be ascertained that, the Workforce participation was highest for Agriculture and allied activities (at 42.6 percent), and Manufacturing, Trade and Services – each of these sections employed nearly 12 to 14 percent of the Workforce. Transport, Construction, Finance and Mining displayed lower rates (the percent contribution being 5.8, 4.9, 3.1, 1.06 respectively) with the lowest being Electricity, Gas and Water with a Workforce participation rate of 0.4 percent.

Graph 2.1 - Percentage contribution of the workforce to various industrial sections in Kerala in the year 1993



Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 50

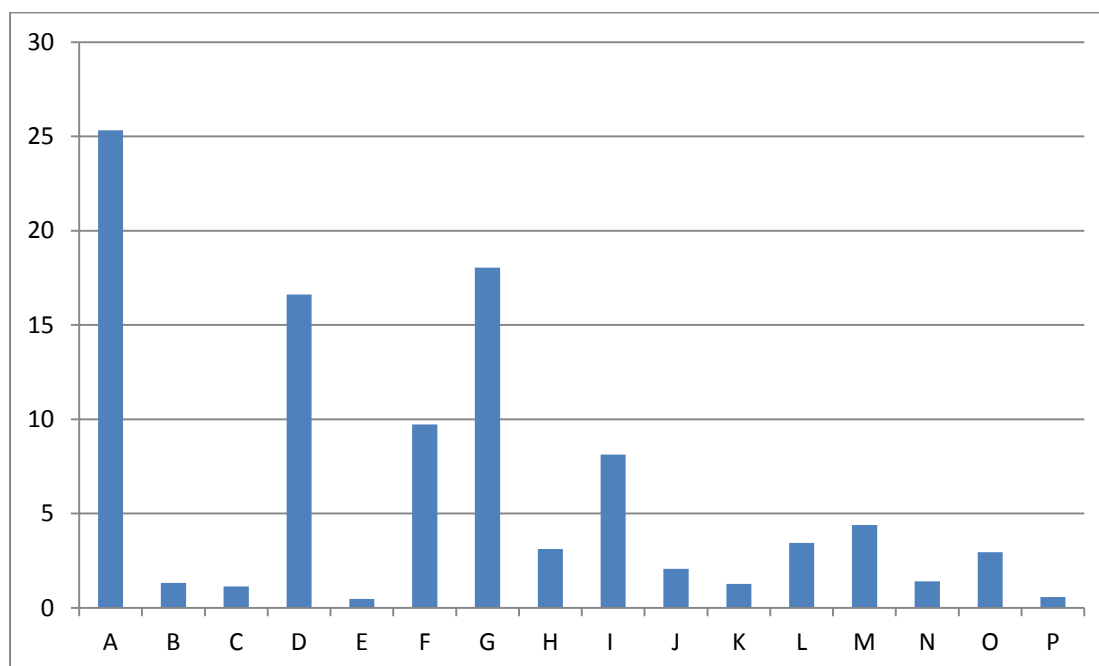
The above graph illustrates the percentage contribution of the workforce to the nine broad sections of industry, (corresponding to the NIC 1987) for Kerala, in the year 1993. The X axis denotes the following sections:

SECTION

SECTION CODE	DESCRIPTION OF SECTION CODE
0	Agriculture, Hunting, Forestry, Fishing
1	Mining And Quarrying
2&3	Manufacturing
4	Electricity, Gas And Water
5	Construction
6	Wholesale, Retail Trade, Hotels & Restaurants
7	Transport, Storage, Communications
8	Financing, Insurance, Real Estate And Business Services
9	Community, Social And Personal Services

Agriculture had the highest rate of Workforce participation, at 38.86 percent. The sections Manufacturing, Trade and Social services displayed a share of about 15 percent each, and Transport, and financing sectors commanded a moderate share of 6.23 and 4.58, while the remaining sectors displayed lower rates below one percent.

Graph 3.1 - Percentage contribution of the workforce to various industrial sections in Kerala in the year 1999



Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 55

The above graph illustrates the percentage contribution of the workforce (measured through the Usual Principal Activity Status, or UPS) to the fifteen broad sections of industry, as designated by the NIC 1998 for Kerala, in the year 1998.

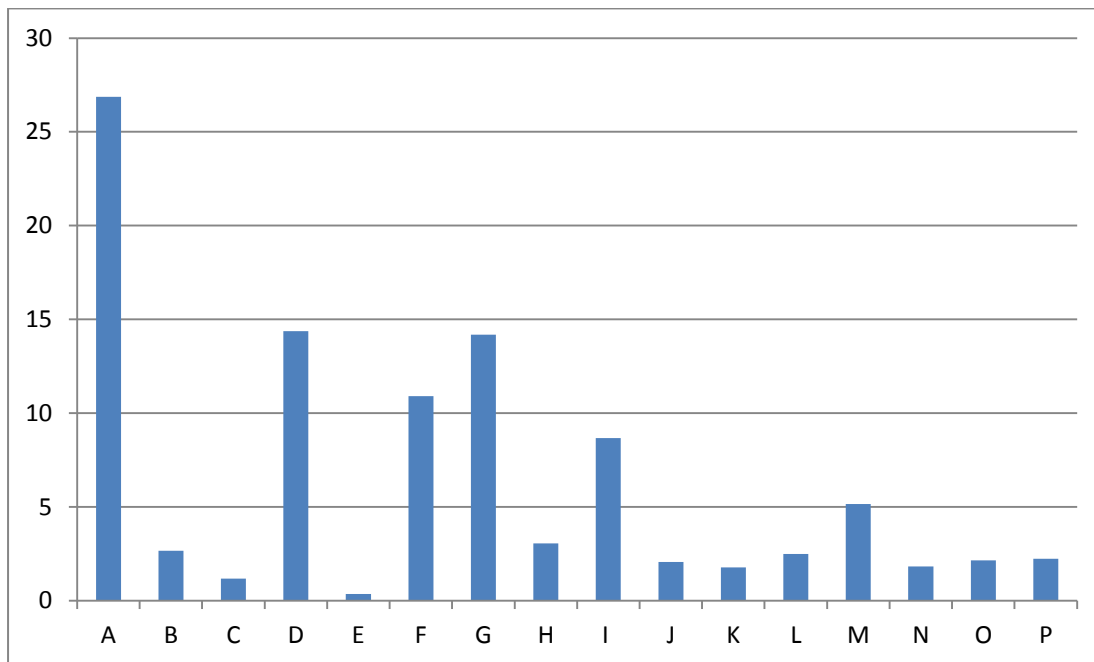
The X axis labels, (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P) represent the sixteen industrial sections as per NIC 1998.

- A** Agriculture
- B** Fishing
- C** Mining and Quarrying
- D** Manufacturing
- E** Electricity, Gas etc
- F** Construction
- G** Wholesale and Retail Trade, Motor vehicles and repair, Personal and Household goods
- H** Hotels and Restaurants
- I** Transport, Storage, Communication
- J** Financial Intermediation
- K** Real estate, Renting and Business Activities
- L** Public Administration, Defence, Compulsory Social Security
- M** Education
- N** Health and Social Work
- O** Other Community, Social and Personal Services
- P** Private Household with employed persons

The Y axis denotes the percentage contribution of the Workforce (as reflected by the UPS), and the height of each column corresponding to a specific section of the industry, denotes the percentage contribution of Workforce to that industrial section.

From the graph, it can be ascertained that, the Workforce participation was highest for Agriculture at 25percent. Industries such as Manufacturing and Trade employed a fairly high share of around 17 percent each. Construction, and Hotel and Restaurants displayed a moderate share of 9.72 and 8.13 respectively. Real Estate, Fishing, Mining and Quarrying, and Electricity received a relatively lower proportion, with participates rates below 3 percent.

Graph 4.1 –Percentage contribution of the workforce to various industrial sections in Kerala in the year 2004-2005



Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 61

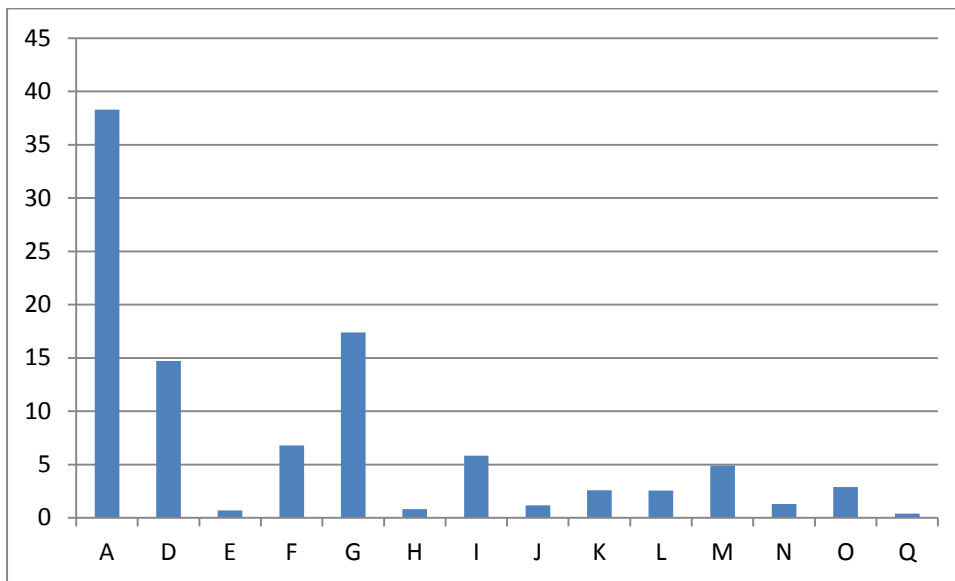
The above graph illustrates the percentage contribution of the workforce (measured through the Usual Principal Activity Status, or UPS) to the nine broad sections of industry, as designated by the NIC 2004 for Kerala, in the year 2004-2005.

The X axis denotes the following sections: (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, and P) with the section descriptions being the same as described in Graph 2.1

The Y axis is defined in a similar manner as described in the previous graphs.

From the graph, it can be established that, the Workforce participation was highest, yet again, for Agriculture at 26.8 percent. Once again, Industries such as Manufacturing and Trade employed a fairly high share of around 14 percent each. Construction, and Transport and Storage commanded a moderate share of 10.9 and 8.6 respectively, while Education grew modestly at a rate of 5.15 percent, and Hotels and Restaurants grew at a pace of 3.18. The remaining sections exhibited growth rates lower than 3 percent, the lowest being Electricity and Gas, which received a Workforce participation rate of 0.35.

Graph 5.1 –Percentage contribution of the Workforce to various industrial sections in Kerala in the year 2007-08



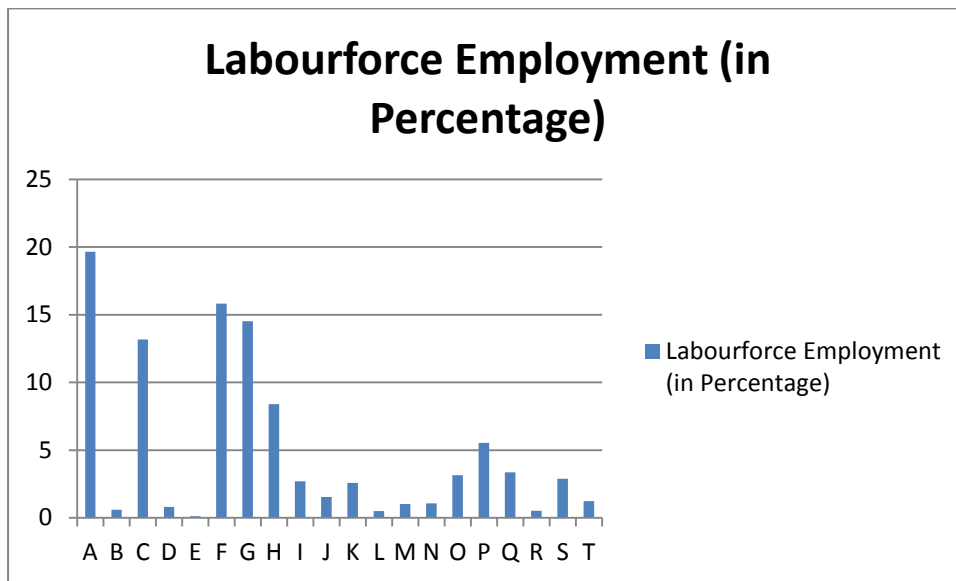
Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 64

The above graph illustrates the percentage contribution of the workforce (measured through the Usual Principal Activity Status, or UPS) to the nine broad sections of industry, as designated by the NIC 2004 for Kerala, in the year 2007-2008.

The X axis denotes the following sections: (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, and P) with the section descriptions being the same as described in the previous graph, and the Y axis is defined in a similar manner as well.

From the graph, it can be seen that, the Workforce participation was highest, yet again, for Agriculture at 38.3 percent. After Agriculture, the sectors Manufacturing and Trade received a share of 14.73 17.38 percent respectively. Construction, Transport and Education reflected a moderate size of around 5 percent, while the rest of the sections reported rates below 3 percent, the lowest being Activities of Extraterritorial Body and Organisations at 0.4.

Graph 6.1 –Percentage contribution of the workforce to various industrial sections in Kerala in the year 2011-12



Source: Own estimates based on unit level data extracted from National Sample Survey Organisation (NSSO) round 68

The above graph illustrates the percentage contribution of the workforce (measured through the Usual Principal Activity Status, or UPS) to the nine broad sections of industry, as designated by the NIC 2004 for Kerala, in the year 2011-12.

The X axis denotes the following sections: (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S and T) with the section descriptions altered according to NIC 2008.

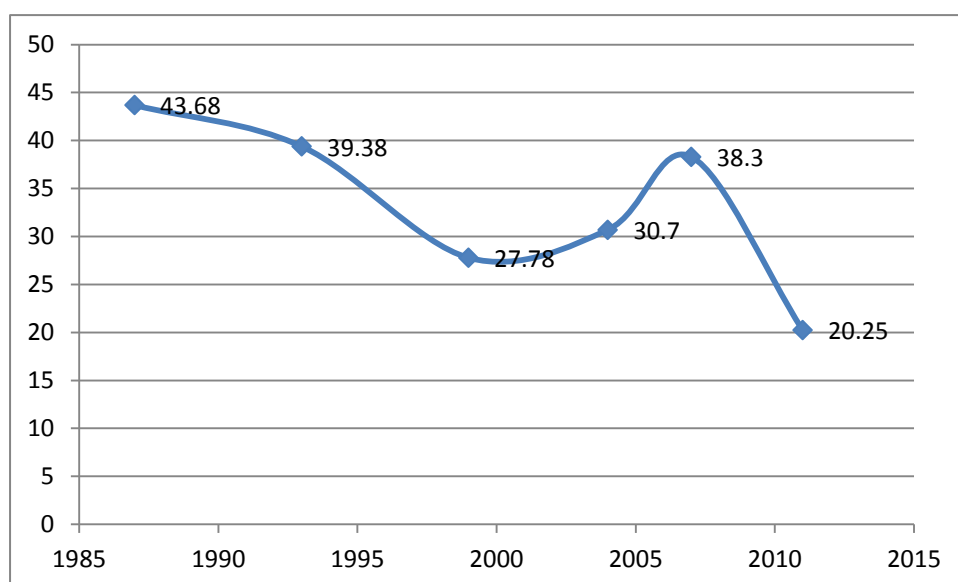
The Y axis is defined as previously described.

From the graph, it can be established that, the Workforce participation was highest, yet again, for Agriculture at 19.6 percent. Once again, Industries such as Manufacturing and Trade employed a fairly high share of around 14 percent each. The lowest was, Arts Electricity and Gas, which received a Workforce participation rate of 0.12.

CONCLUDING REMARKS

In order to ascertain the possibility and nature of a structural shift in the pattern of workforce from 1980s to late 2000s, we look at the sectoral composition of the three broad sectors, viz, the Primary, Secondary and Tertiary sectors over the time period in reference.

Graph 1.2 – **Percentage contribution of the workforce to the primary sector over the time period**

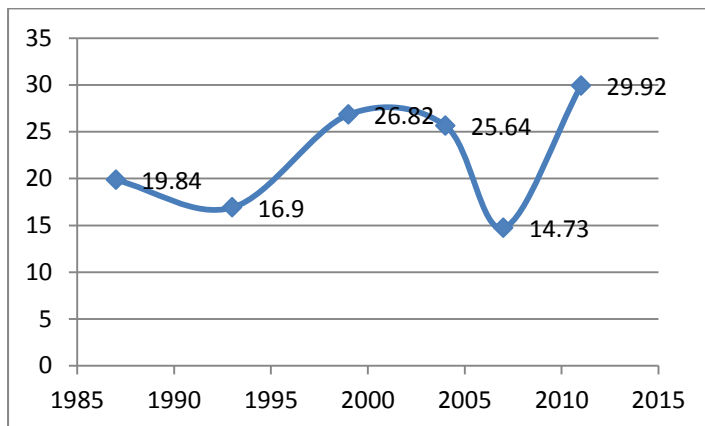


Source : Own estimates aggregated from NSSO unit level data

From the graph, it can be clearly seen that, the Primary Sector, comprising Agriculture, forestry, fishing and Mining and Quarrying; has relatively undergone the maximum decline in terms of the worker-population-ratio, from 43.68 percent in 1987-88 to 20.25 percent in 2011-12, marking a decline of 23.43 percent.

The workforce participation was the highest in the year 1987 at 43.68 percentages, and it declined steadily till 1999-2000, plummeting at 27.78 percentages, after which it rose steadily till 2007-2008, at 38.3 percent. This rise can be attributed to the agrarian crisis - the effects of the same pervaded into the economy from 1999. During this period, the employment in the primary sector (agriculture) rose consistently as workers were unable to find jobs and shift to other sectors, thus the economy experienced overemployment in agriculture, and a general deterioration in wages. The effects of the agrarian crisis weaned off by 2011-12, and the year marks a huge decline in workforce participation in the primary sector.

Graph 2.2 –Percentage contribution of the workforce to the secondary sector over the time period



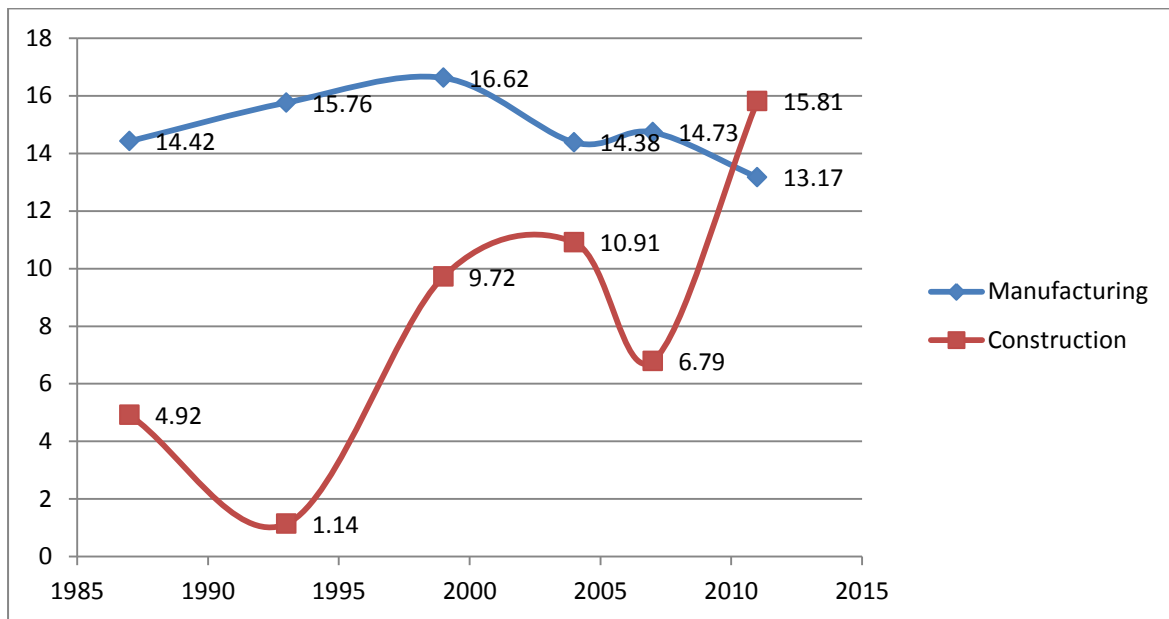
Source : Own estimates aggregated from NSSO unit level data

The graph reveals that the Secondary Sector, (comprising Manufacturing, Electricity and Water Supply, and Construction) has experienced a rise in the worker-population-ratio, from 19.84 percent in 1987-88 to 29.92 percent in 2011-12 (which is the highest among the years), marking a rise of 9.92 percent.

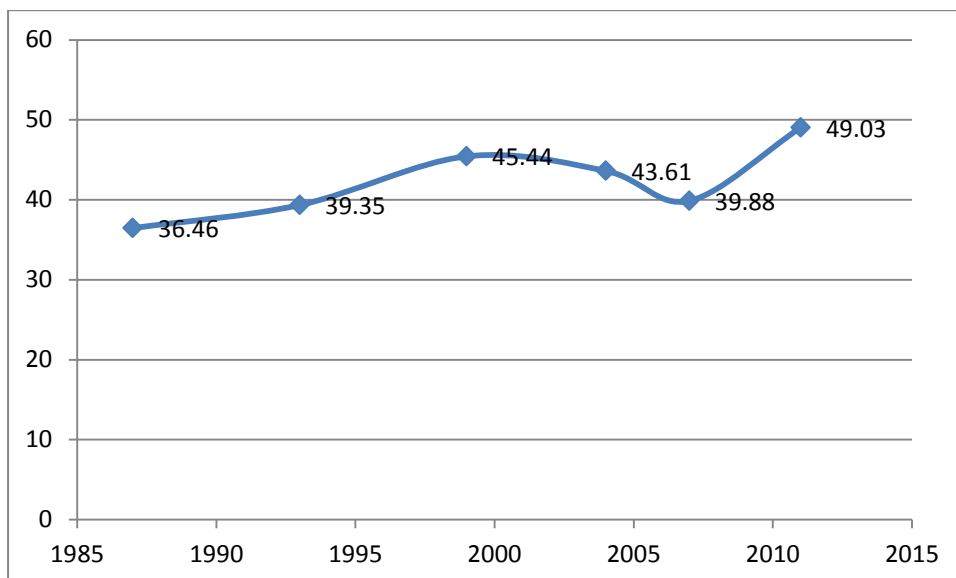
The workforce participation declined from 19.84 percentages to 16.9 percentages from 1987 to 1993, and rose steadily to 26.82 percentages, before plummeting down to a record low of 14.73 percentage in 2007-08, and then rose to 29.92 percentages in 2011-12.

However, when we look at the secondary sector at a more disaggregated level, we find that, the Manufacturing sector hasn't undergone much of a change for Kerala, stagnating at around 14 percent throughout the years. The actual change in the Secondary Sector can be attributed to Construction, which has shown a rise from 4.92 percent in 1987-88 to 15.81 percent in 2011-12, a rise of 10.89 percent.

Graph 3.2 –Percentage contribution of the workforce to the manufacturing and construction sector over the time period



Graph 4.2 –Percentage contribution of the workforce to the tertiary sector over the time period



Source: Own estimates aggregated from NSSO unit level data

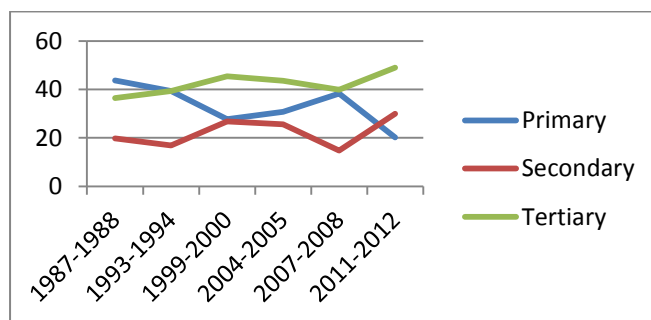
The graph shows that, the service sector has experienced the highest relative growth in workforce population ratio, from 36.46 percent in 1987-88, to 49.03 percent in 2011-12, marking an increase of 12.57 percent.

The workforce participation rate rose steadily from 36.46 in 1987 to 44.61 percent in 1999, after which it declined to 39.88 in 2007-08. The stark reduction in the year 2007-08 can also be attributed to the effect of the Global Financial Crisis, which dealt a blow to

employment in the service sector. The economy experienced a rise to 49.03 percentages in the year 2011-12, which was the highest for the years under consideration.

Thus, there has been a structural shift in employment from the primary sector, but unlike the evidences from the stories of developing economies in transition where the structural shift in employment occurs from the primary to the manufacturing sector, in Kerala, we notice a different trend – the nature of the shift has been from agriculture to the service sector over the transition phase of 1980s to late 2000s, whence the manufacturing sector has experienced little growth across the time period under consideration.

Graph 5.2–Percentage contribution of the workforce to the three broad sectors over the time period



Source : Own estimates aggregated from NSSO unit level data

CONCLUSION

There is no doubt about the fact that the rapid growth in non-agricultural employment over the last decade in India appears to be the kind of structural transformation Lewis conceived. Not only is there a marked shift in employment from agriculture to industry and services, but it has almost happened keeping real wages in the modern sector more or less unchanged. Kerala, too had a very similar experience as it transitioned through a service led growth as the manufacturing sector grew marginally, while the construction sector grew rapidly.

In Kerala’s experience, however, the source of the service led growth was the demographic transition and labour migration which resulted from Kerala’s investment in social development. India had several factors such as its colonial history, reforms of 1990s and outsourcing which have been mentioned in the paper.

There are several factors distinguishing Kerala’s growth story with India’s; which include the fact that the transition in Kerala occurred much earlier than in India, and the transition led to a huge informalisation of labour and jobless economic growth in the latter half of 2000s, while Kerala saw significant occurrences of educated unemployment and defeminisation which was more severe than in India. Also, unlike India where the shift was from agriculture to construction, Kerala saw migration away from the state to the Gulf, which has led to social costs of migration, change in family dynamics as one parent stays abroad, change in the role of women, separation, and to an ageing population to name a few. Though growth is essential

for any country, it must be done in such a way that social costs aren't over-burdening for the future generations.

EXTENTION

The project could be further extended to incorporate the precise time frame of structural transformation, by carrying out a structural break test. However, this would require time series data on employment and unemployment in Kerala, and could not be carried out to the unavailability of the same.

REFERENCES

1. Kannan, K. (2005). Kerala's Turnaround in Growth: Role of Social Development, Remittances and Reform. *Economic and Political Weekly*, 40(6), 548-554
2. Achin Chakraborty. (2005). Kerala's Changing Development Narratives. *Economic and Political Weekly*, 40(6), 541-547.
3. Subrahmanian, K. (2006). Economic Growth in the Regime of Reforms: Kerala's Experience. *Economic and Political Weekly*, 41(10), 885-890
4. K. N. Harilal & K. J. Joseph. (2003). Stagnation and Revival of Kerala Economy: An Open Economy Perspective. *Economic and Political Weekly*, 38(23), 2286-2294
5. Subrahmanian, K., & Pillai, P. (1986). Kerala's Industrial Backwardness: Exploration of Alternative Hypotheses. *Economic and Political Weekly*, 21(14), 577-592.
6. Subrahmanian, K. K. "Development Paradox in Kerala: Analysis of Industrial Stagnation." *Economic and Political Weekly* 25, no. 37 (1990): 2053-058
7. Pillai, P., & Shanta, N. (2005). Kerala's Turnaround in Growth. *Economic and Political Weekly*, 40(41), 4481-4483.
8. Abraham, V. (2013) Missing Labour or Consistent "De-feminisation"? *Economic and Political Weekly*, Vol 48, Issue No. 31

APPENDIX

TABLE 1.1 :

Workforce Participation Rate (in Percentage) corresponding to the two digit division code (NIC 1987) in Kerala, 1987

DIVISION CODE (NIC 1987)	WORKFORCE PARTICIPATION (Percentage)
0	13.99973308
1	23.23501935
2	1.908447885
3	0.173495262
5	0.560523155
6	2.735886828
0	42.61879338
11	0.040037368
19	1.027625784
1	1.067805659
20	1.014279995
21	1.094354731
22	1.521419992
23	0.640597891
24	0.053383158
25	0.21353263
26	3.523288403
27	2.789269985
28	0.45375684
29	0.053383158
30	0.387027893
31	0.266915788
32	1.10770052
33	0.080074736
34	0.520485787
35	0.186841052
36	0.253569999
37	0.066728947
38	0.160149473
39	0.040037368
2&3	14.42872397
40	0.44041105
42	0.040037368
46	0.013345789

4	0.493860117
50	4.390764714
51	0.533831576
55	0.013345789
5	4.925253604
60	0.747364207
61	0.080074736
62	0.080074736
63	0.053383158
64	0.320298946
65	6.005605232
66	0.760709996
67	0.920859469
68	1.441345256
69	2.549045776
6	12.96049119
70	5.191512078
71	0.293607367
72	0.040037368
73	0.120112105
74	0.026691579
75	0.21353263
7	5.886278697
80	1.694915254
81	0.280261577
82	0.787401575
83	0.373682103
87	0.013345789
8	3.150026695
90	3.323101561
91	0.053383158
92	4.764446817
93	1.387962098
94	0.720672628
95	0.266915788
96	2.749232617
97	1.174429468
99	0.026691579
9	14.46876668

TABLE 1.2

Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 1987) in Kerala, 1987

Description of section code	Code	Participation(%)
Agriculture, hunting, forestry, fishing	0	42.61879338
Mining and quarrying	1	1.067805659
Manufacturing	2&3	14.42872397
Electricity, gas and water	4	0.493860117
Construction	5	4.925253604
Wholesale, retail trade, hotels & restaurants	6	12.96049119
Transport, storage, communications	7	5.886278697
Financing, insurance, real estate and business services	8	3.150026695
Community, social and personal services	9	14.46876668

TABLE 2.1 :

Workforce Participation Rate (in Percentage) corresponding to the two digit division code (NIC 1998) in Kerala, 1993

DIVISION CODE	WORKFORCE PERCENTAGE
0	10.83
1	22.51
2	1.32
3	0.71
5	0.42
6	2.57
0	38.86
7	0.04
8	0.02
10	0.03
11	0.02
14	0.02
15	1.07
19	0.08
1	1.12
20-21	2.21
22	1.83
23	1
24	0.38
25	1.61
26	1.16
27	2.13
28	0.53
29	0.06
30	0.49
31	0.38
32	0.91
33	0.14
34	0.54
35	0.12
36	0.24
37	0.08
38	0.73
39	0.07
38	0.73
39	0.42

2&3	15.76
40	0.4
42	0.08
42	0.06
47	0.07
4	0.61
50	5.84
51	1.1
53	0.02
56	0.02
5	1.14
60	0.9
61	0.4
62	0.08
63	0.51
64	0.34
65	5.34
66	0.14
67	0.85
68	2.07
69	2.24
6	12.87
70	5.11
71	0.26
72	0.05
73	0.25
74	0.03
75	0.53
7	6.23
80	1.66
81	0.26
83	0.18
84	0.08
85	0.08
88	0.02
89	2.3
8	4.58
90	3.19
91	0.08
92	4.81
93	1.41
94	0.59

95	0.41
96	3.61
97	1.43
98	0.03
99	0.08
9	15.64
X	0.03

TABLE 2.2 : Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 1987) in Kerala, 1999

Description of section code	Section Codes	Workforce Participation
Agriculture, hunting, forestry, fishing	0	38.86
Mining and quarrying	1	1.12
Manufacturing	2&3	15.76
Construction	5	1.14
Wholesale, retail trade, hotels & restaurants	6	12.87
Transport, storage, communications	7	6.23
Financing, insurance, real estate and business services	8	4.58
Community, social and personal services	9	15.64
Activities not adequately defined	X	0.03

TABLE 3.1 :**Workforce Participation Rate (in Percentage) corresponding to the two digit division code (NIC 1998) in Kerala, 1999**

Division Code (NIC 1998)	Workforce Participation (in Percentage)
1	25.2
2	0.13
A	25.33
5	1.31
B	1.32
11	0.03
13	0.01
14	1.09
C	1.13
15	3.06
16	1.38
17	3.44
18	0.9
19	0.23
20	2.05
21	0.19
22	0.51
23	0.04
24	0.6
25	0.41
26	0.98
27	0.16
28	0.7
29	0.07
31	0.19
32	0.1
34	0.06
35	0.03
36	1.52
D	16.62
41	0.48
E	0.48
45	9.72
F	9.72
50	1.81

51	1.91
52	14.33
G	18.05
55	3.12
H	3.12
60	6.73
61	0.09
63	0.47
64	0.84
I	8.13
65	1.65
66	0.29
67	0.13
J	2.07
70	0.12
71	0.22
72	0.12
73	0.06
74	0.76
K	1.28
75	3.44
L	3.44
80	4.4
M	4.4
85	1.41
N	1.41
90	0.03
91	0.61
92	0.51
93	1.81
O	2.96
95	0.58
P	0.58

TABLE 3.2 : Workforce Participation Rate (in Percentage) corresponding to the section code

Division Code (NIC 2004)	DESCRIPTION OF SECTION CODE	Percentage
A	Agriculture	26.86
B	Fishing	2.66
C	Mining and Quarrying	1.18
D	Manufacturing	14.38
E	Electricity, Gas etc	0.35
F	Construction	10.91
G	Wholesale and Retail Trade, Motor vehicles and repair, Personal and Household goods	14.19
H	Hotels and Restaurants	3.06
I	Transport, Storage, Communication	8.67
J	Financial Intermediation	2.07
K	Real estate, Renting and Business Activities	1.77
L	Public Administration, Defence, Compulsory Social Security	2.5
M	Education	5.15
N	Health and Social Work	1.82
O	Other Community, Social and Personal Services	2.15
P	Private Household with employed persons	2.23

Table 4.1

Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2004) in Kerala, 2004

Division (NIC 2004)	Code	Percent
1		26.51
2		0.35
A		26.86
5		2.66
B		2.66
13		0.01
14		1.17
C		1.18
15		2.76
16		0.83
17		2.22
18		2.08
19		0.13
20		1.58
21		0.17
22		0.32
23		0.04
24		0.37
25		0.37
26		0.53
27		0.04
28		0.79
29		0.17
30		0.04
31		0.07
32		0.05
33		0.03
34		0.03
35		0.16
36		1.6
D		14.38
41		0.35
E		0.35

45	10.91
F	10.91
50	1.33
51	1.97
52	10.89
G	14.19
55	3.06
H	3.06
60	7.2
61	0.09
62	0.01
63	0.4
64	0.97
I	8.67
65	1.74
66	0.25
67	0.08
J	2.07
70	0.2
71	0.47
72	0.09
73	0.04
74	0.97
K	1.77
75	2.5
L	75
80	5.15
M	5.15
85	1.82
N	1.82
90	0.03
91	0.85
92	0.39
93	0.88
O	2.15
95	2.23
P	2.23

TABLE 4.2 : Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2008) in the year 2004-05

Section Description	Division Code (NIC 2004)	Percent
Agriculture	A	26.86
Fishing	B	2.66
Mining and Quarrying	C	1.18
Manufacturing	D	14.38
Electricity, Gas etc	E	0.35
Wholesale Construction	F	10.91
Wholesale and Retail Trade, Motor vehicles and repair, Personal and Household goods	G	14.19
Hotels and Restaurants	H	3.06
Transport, Storage, Communication	I	8.67
Financial Intermediation	J	2.07
Real estate, Renting and Business Activities	K	1.77
Public Administration, Defence, Compulsory Social Security	L	75
Education	M	5.15
Health and Social Work	N	1.82
Other Community, Social and Personal Services	O	2.15
Private Household with employed persons	P	2.23

Table 5.1

Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2004) in Kerala, 2007-08

Division Code	Percent
1	38.26
2	0.04
A	38.3
15	1.97
17	3.71
18	1.89
19	0.12
20	0.55
21	0.16
22	0.2
24	0.32
25	0.2
26	0.95
27	0.99
28	0.83
29	0.63
31	0.2
32	0.08
33	0.04
35	0.59
36	1.3
D	14.73
41	0.71
E	0.71
45	6.79
F	6.79
50	0.95
51	2.65
52	13.78
G	17.38
55	0.83
H	0.83
60	5.01
63	0.16
64	0.67
I	5.84

65	0.99
66	0.12
67	0.08
J	1.19
70	0.36
71	0.28
72	0.08
74	1.5
K	2.58
75	2.57
L	2.57
80	4.9
M	4.9
85	1.3
N	1.3
90	0.24
91	0.71
92	0.32
93	1.62
O	2.89
95001	0.4
Q	0.4

TABLE5.2 : Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2008) in the year 2011-12

Section Description	Section Code	Workforce Participation (Percentage)
Agriculture	A	38.3
Manufacturing	D	14.73
Electricity, Gas etc	E	0.71
Construction	F	6.79
Wholesale and Retail Trade, Motor vehicles and repair, Personal and Household goods	G	17.38
Hotels and Restaurants	H	0.83
Transport, Storage, Communication	I	5.84
Financial Intermediation	J	1.19
Real estate, Renting and Business Activities	K	2.58
Public Administration, Defence, Compulsory Social Security	L	2.57
Education	M	4.9
Health and Social Work	N	1.3
Other Community, Social and Personal Services	O	2.89
Extraterrestrial Body and Organisations	Q	0.4

Table 6.1 Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2008) in Kerala, 2011-12

Division Code	Percentage
1	17.56
2	0.32
3	1.78
A	19.66
7	0.02
8	0.57
B	0.59
10	2.46
11	0.28
12	0.55
13	1.13
14	2.11
15	0.07
16	1.53
17	0.05
18	0.23
19	0.07
20	0.17
21	0.12
22	0.33
23	0.63
24	0.02
25	1.02
26	0.05
27	0.1
28	0.03
29	0.02
30	0.1
31	1.22
32	0.73
33	0.15
C	13.17
35	0.82
D	0.82
36	0.08
38	0.02

39	0.02
E	0.12
41	10.35
42	1.38
43	4.08
F	15.81
45	1.9
46	2.13
47	11.29
G	14.51
49	7.49
50	0.16
51	0.07
52	0.35
53	0.33
H	8.4
56	2.71
I	2.71
58	0.23
59	0.03
60	0.02
61	0.6
62	0.53
63	0.13
J	1.54
64	1.93
65	0.35
66	0.3
K	2.58
68	0.5
L	0.5
69	0.5
70	0.02
71	0.08
72	0.07
73	0.05
74	0.28
75	0.03
M	1.03
77	0.35
78	0.03
79	0.12

80	0.17
81	0.08
82	0.33
N	1.08
84	3.16
O	3.16
85	5.53
P	5.53
86	2.98
87	0.1
88	0.28
Q	3.36
90	0.23
92	0.22
93	0.07
R	0.52
94	0.68
95	0.47
96	1.73
S	2.88
97	1.23
T	1.23

TABLE 6.2 : Workforce Participation Rate (in Percentage) corresponding to the section code (NIC 2008) in the year 2011-12

Description of Section	Section Code	Labourforce Employment (in Percentage)
Agriculture, forestry and fishing	A	19.66
Mining and quarrying	B	0.59
Manufacturing	C	13.17
Electricity, gas, steam and air conditioning supply	D	0.82
Water supply; sewerage, waste management and remediation activities	E	0.12
Construction	F	15.81
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	14.51
Transportation and storage	H	8.4
Accommodation and Food service activities	I	2.71
Information and communication	J	1.54
Financial and insurance activities	K	2.58
Real estate activities	L	0.5
Professional, scientific and technical activities	M	1.03
Administrative and support service activities	N	1.08
Public administration and defence; compulsory social security	O	3.16
Education	P	5.53
Human health and social work activities	Q	3.36
Arts, entertainment and recreation	R	0.52
Other service activities	S	2.88
Activities of households as employers; undifferentiated goods- and services producing activities of households for own use	T	1.23

Table 7.1 : Workforce Participation Rate (in Percentage) corresponding to various sectors over the years

Year	Agriculture	Mining and Quarrying	Manufacturing	Construction	Service Others
1987	42.61	1.067	14.42	4.92	36.46
1993	38.86	1.12	15.76	1.14	39.35
1999	26.65	1.13	16.62	9.72	45.44
2004	29.52	1.18	14.38	10.91	43.61
2007	38.3	0	14.73	6.79	39.88
2011	19.66	0.59	13.17	15.81	49.03

Table 7.2 : Workforce Participation Rate (in Percentage) corresponding to the primary, secondary and tertiary sector over the years

Year	Year	Primary	Secondary	Tertiary
1987-1988	1987	43.68	19.84	36.46
1993-1994	1993	39.38	16.9	39.35
1999-2000	1999	27.78	26.82	45.44
2004-2005	2004	30.7	25.64	43.61
2007-2008	2007	38.3	14.73	39.88
2011-2012	2011	20.25	29.92	49.03