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RESEARCH ARTICLE

Social inequalities in IT sector: Evidence from Kerala State in India

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ABSTRACT

In Kerala's economy, information technology (IT) sector adorns a place of pride, Kerala being a state in India with the topmost literacy and a large share of technically qualified population. Kerala's IT sector contributes significantly to the employment creation and also the foreign exchange earnings (FEEs) by way of software exports. As the long-term sustainability of any sector depends on equity and distributive justice among its employees, this study critically analyses the inequality among the IT sector employees at InfoPark in Kerala State in India. A sample survey methodology has been used in this study. Analytical tools like Gini co-efficient have been adopted in the study. The study has revealed clear inequalities among the IT sector employees in their career progression. Women, lower castes, certain religious minorities, etc., are the major sufferers, especially the SC/STs. The share of Muslims among the IT sector employees is low, and the inequality is the least. Based on the study findings, the paper suggests strategies for the sustained growth of IT sector.

Keywords: social status; inequality; caste; minority; mobility; economic growth; IT sector

1. Introduction

Though India has completed 75 years since the nation gained independence, social inequality is still persisting in the country. Even in this 21st century, social inequality in India poses a hurdle to the country's fast and equitable economic development, and it impedes the upward social mobility of the deprived segments of the Indian society. In this paper, considering one specific social factor (religion or caste), a study has been conducted to find the representation of the minority communities and also deprived segments like the Scheduled Caste (SC)/Scheduled Tribe (ST) communities in the IT sector in Kerala. A poor representation of SC/STs and minorities (Muslims) was revealed. The caste decomposition of income distribution was done by conducting a questionnaire survey among 530 professionals working at InfoPark, Kochi to understand if any group was facing more income inequality than its peers. The IT sector companies in Kerala used to provide wages to their employees at a level lower than their wage expectations, right from their entry into the IT career. The issues of disparities and lower wages having been noticed in the SEZ (Special Economic Zone) in Kerala, the Govt. of Kerala (GoK) intervened and minimum wages were fixed in the IT sector: specifically, at InfoPark, Kochi in 2017–2018. InfoPark is located at SEZ in Ernakulam in central Kerala.

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2. Objectives of the study

1) To make an overview of the IT sector in India with a focus on InfoPark at Ernakulam (Kochi) which is located in an SEZ area in central Kerala;

2) To study the representation of main religions and castes among the IT sector employees in InfoPark, Ernakulam (Kochi) and the inequalities existing amongst them, if any;

3) To frame strategies for inequality-free and sustained development of the IT sector.

3. Research questions

1) What is the overall picture of India's IT sector, especially that of InfoPark in Kerala?

2) What is the profile of IT sector employees based on their social groups? Is there any income inequality among the IT sector employees based on their social status?

3) What are the strategies for the inequality-free and hence sustained growth of IT sector?

4. Literature review

Yitzhaki[1] has extended the Gini inequality index, starting right from the seminal paper of Atkinson (1970), going through Sen's measure (1976), Kakwani's co-efficient (1980) and derived a parametric variant of Gini co-efficient which had the merit that it could be expressed as a function of Lorenz curve. Lerman and Yitzhaki[2] tried to find and interpret Gini index. Yu and Zhang[3] have found that the degree of correlation existing between income and education of diverse races is statistically significant. Upadhya and Vasavi[4] have found that most IT professionals belong to the middle class, educated, urban backgrounds, and from the upper castes, since the companies used to select the best students from the best colleges where the large pool of engineering and other graduates available, tend to be from middle class, urban families. A research study by Manju Dhillon[5] has suggested employee retention strategies for the IT sector in India Manoj[6], "ICT industry in India: A SWOT analysis", in Journal of Global Economy made a macro level analysis of the ICT industry in India. Subramanian[7] made a sociological study of the employees of ITI (Indian Telephone Industries), Bangalore, India; and noted that the largest group of ITI employees belonged to families where the father was a worker in industrial or service sector; and that employees from the wage earning families were less successful in career progression vis-a-vis others. Luke and Thapa[8] noted that sustained economic empowerment of women in the most disadvantaged social groups led to striking improvement in educational attainment and thus low gender and caste inequalities.

Deshpande and Palshikar[9] studied the relation between caste and occupation, and intergenerational occupational mobility across 4 distinct generations among various castes in Pune city in Maharashtra, India. Caste was found to be not strongly related to occupational mobility but was vital for upward mobility. Pickens[10] has noted the vital role of technology especially the most widely used ones like mobile phones in banking the unbanked in the context of Philippines. Wilson[11] has noted that livelihoods in rural India became growingly connected to the wider economy, and caused marked variations to the wellbeing of households causing simultaneous shifts into and out of poverty; the worst hit in the free market economy being the socially and economically disadvantaged groups. Corak[12] has studied the impact of income inequality on opportunities and intergenerational mobility, and noted marked influence of the earnings of parents on the education and career of children. Manoj and John[13] "Prospects of Cattle Feed Industry in India and Strategies for Utilizing the Market Potential: A Study in Kerala with a Focus on Factors Influencing Buyer Behaviour" have suggested various strategies to use the huge market potential of cattle

feed—an industry that can greatly support the livelihood of the poor and the marginalised and reduce social inequality in India. As a continuation of this joint study, another study on this strategic industry by Manoj[14] "Cattle feed industry in India: a macro perspective" has analysed in detail the cattle feed industry in India that can bring about inclusive and sustainable growth and reduce inequalities in the society and has suggested strategies too for its sustained growth in the country. Joju and Manoj[15] "Digital Kerala: A study of the ICT Initiatives in Kerala State" have analysed the ICT initiatives in the Kerala—the State with the highest Internet penetration and universal literacy and have suggested strategies for more effective use of ICT for its economic growth. Asian Development Bank[16] in its report as noted that the positive impact of sustainable urban development project in Kerala on the livelihood and living standards of women and girls could empower them and create more avenues for earning income also.

Lauer and Timothy[17] have pointed out the positive effect of ICT (Digital channels) on financial inclusion, and the implications of ICT-based interventions. Manoj[18], "Potential of micro enterprises in women empowerment: A critical study of micro enterprises run by women under the Kudumbashree Programme in Kerala" in *International Journal of Business Policy and Economics*, has noted the potential of micro enterprises in women empowerment. Manoj[19] "Information and Communication Technology (ICT) for effective implementation of MGNREGA in India: An analysis" in *Digital Economy of India-Security and Privacy*, has observed the utmost relevance of ICT in MGNREGA execution. Nasar and Manoj[20] "Customer satisfaction on service quality of real estate agencies: An empirical analysis with reference to Kochi Corporation Area of Kerala State in India" have suggested advanced educational and developmental efforts for real estate agencies, need for better transparency in all dealings and the use of social networks. James and Manoj[21] "Relevance of E-Banking Services in Rural Area—An Empirical Investigation" have observed the immense potential of ICT-based banking services for women empowerment and rural development, and suggested extension of ICT-based banking services in rural areas. A study by Manoj[22], "Socio-Economic Impact of Housing Microfinance: Findings of a Field based Study in Kerala, India" in *International Research Journal of Finance and Economics* has noted the role of housing microfinance for sustained economic growth. Manoj[23], "Deterrents to the Housing Microfinance: Evidence from a Study of the Bankers to 'Bhavanashree' in Kerala, India" in *International Research Journal of Finance and Economics*, has pointed out the deterrents to the growth of HMF in Kerala and suggested remedial strategies. Joju J, Vasantha S, and Manoj PK[24] "E-CRM: A Perspective of Urban & Rural Banks in Kerala" have noted ICT-based CRM or Electronic-CRM (E-CRM) has a positive impact in both urban and rural banking and has suggested separate strategies for both, based on the findings of their research study. Manoj and Viswanath[25] "Socio-Economic Conditions of Migrant Labourers—An Empirical Study in Kerala" has noted the vital need for enhancing the working and living conditions of migrants. Rajesh and Manoj[26] "Women Employees work life and challenges to Industrial Relations: Evidence from North Kerala" have noted the utmost need for striking work-life balance for women employees for healthier industrial relations. The vital need for adopting technology and ICT advances for better productivity is clear from all these studies. Similarly, Manoj[27] "Bank marketing in India in the current ICT era: Strategies for effective promotion of bank products" has observed the crucial need for ICT for the marketing of banking products in India in the current digital era.

Manoj[28] "Determinants of sustainability of rural tourism: a study of tourists at Kumbalangi in Kerala, India" has identified various factors influencing sustainability of rural tourism, and improving ICT infrastructure and facilitating online reservation, etc. is one among these factors identified and recommended by the author. Manoj[29] "Prospects and Problems of Housing Microfinance in India: Evidence from "Bhavanashree" Project in Kerala State" has noted the key significance of housing microfinance (HMF) in India, including Kerala, and in Manoj[30] "Impact of technology on the efficiency and risk management of old

private sector banks in India: Evidence from banks based in Kerala" has noted the key role of IT in enhancing efficiency of banks. Similarly, Manoj[31] "Benchmarking housing finance companies in India: Strategies for enhanced operational efficiency and competitiveness" has made a benchmarking of the HFCs (housing finance companies) and in Manoj[32] "Determinants of profitability and efficiency of old private sector banks in India with focus on banks in Kerala State: an econometric study" has noted the determinants of profitability and efficiency of banks which include, inter alia, technology (ICT) adoption by banks. Two studies have clearly noted that better ICT adoption in a gramin bank (regional rural bank or RRB) could make its service quality superior to that of a co-operative bank, these two studies being: (i) Lakshmi and Manoj[33] "Service quality in rural banking in north Kerala: A comparative study of Kannur district co-operative bank and Kerala Gramin bank" wherein the better ICT-adoption and hence superior service has been noted, and (ii) Lakshmi and Manoj[34] "Rural Customers and ICT-based Bank Products A Study with a Focus on Kannur District Co-operative Bank and Kerala Gramin Bank" wherein the customers' acceptance of ICT-based products has been noted, along with their greater satisfaction with the products of Kerala Gramin Bank (KGB), Kerala's sole RRB. On similar lines, two other papers relating to ICT adoption by banks in this era of digital (virtual) banking have underscored the utmost relevance of ICT in banking: (i) Joju, Vasantha, and Manoj[35] "Future of brick and mortar banking in Kerala: Relevance of branch banking in the digital era" have noted that even when ICT is imminent and also virtual banking, there is still relevance of a 'human touch' as prevalent in traditional mode 'brick and mortar' banking, and (ii) Joju, Vasantha, and Manoj[36] "Financial technology and service quality in banks: Some empirical evidence from the old private sector banks based in Kerala, India" have noted that financial technologies (fin-techs) can greatly improve service quality and are vital or success in modern days. Two studies on cost management have suggested the need for ICT adoption for managing costs, these two studies being: (i) Manoj[37] "Construction costs in affordable housing in Kerala: Relative significance of the various elements of costs of affordable housing projects" where the cost elements have been prioritised for selective and focused control and ICT is an effective tool for the same, and (ii) Manoj[38] "Cost management in the construction of affordable housing units in Kerala: A case study of the relevance of earned value analysis (EVA) approach" wherein EVA has been suggested as an effective approach for managing construction costs. Joju, Vasantha, and Manoj[39] "Electronic CRM & ICT-based banking services: An empirical study of the attitude of customers in Kerala, India" have pointed out the vital significance of ICT-based modern banking practices like E-CRM for efficiency and competitiveness of the banks and also noted the positive attitude of customers to such ICT-based services in their field-based study. A similar study on CRM adoption in the banking sector by Manoj[40] "CRM in old private sector banks and new generation private sector banks in Kerala: A comparison" has noted that new private sector banks (NPBs) are ahead of the old private sector banks (OPBs) in CRM adoption especially in high-tech platforms (like, E-CRM) and hence NPBs have a better command among the customers by giving high-tech services. Manoj[41] "Social banking in India in the reforms era and the case of financial inclusion: Relevance of ICT-based policy options" has suggested ICT-based policy options for social banking in the ICT era. Manoj[42] "Dynamics of human resource management in banks in the ICT era: A study with a focus on Kerala based old private sector banks" has noted the need for ICT-based HRM policies for the competitiveness of banks. Manoj[43] "Competitiveness of manufacturing industry in India: need for flexible manufacturing systems" has noted the need for adopting ICT and modern manufacturing technologies like FMS (flexible manufacturing systems) for the better competitiveness for the manufacturing industry in India. Ali and Manoj[44] "Impact of Falling Price of Rubber—A Case Study of Kothamangalam Taluk in Ernakulam District" has noted the poor productivity due to falling prices, its impact on other industries, the need for maintaining scientific methods, and the need for governmental interventions. All these Indian studies have noted the need for ICT-adoption.

United Nations report, Digital Financial Inclusion, July 2016[45] has noted the significant role of ICT and digital financial services in inclusive growth, by way of poverty reduction and providing the benefits of financial inclusion in developing nations. Besides the IT sector, the IT/ITES applications in many sectors and industries are noted to have a positive effect on the economy. It has also been noted that the use of ICT and allied advances are more eco-friendly and sustainable than the traditional models of development and also that ICT enables women's empowerment. NASSCOM[46], the non-governmental trade association in Indian IT sector, has noted the huge prospects of Indian IT industry against the volatility and slump in global economy. United Nation's report, UNDESA Word Social Report 2020[47] has noted growing inequality globally, mainly arising from four causes viz: 1) technological innovation, 2) urbanisation, 3) international migration, and 4) climate change. It has noted wage inequality as an adverse effect of technological innovation. So, like the Indian studies, the global studies support ICT integration. In other words, all the studies on IT sector, including those on the implication of IT or ICT on other sectors or industries, have noted ICT's inevitability.

There are many studies on IT sector in India, including studies on IT sector employees and a few on their socio-economic status, like religion and caste. While factors like religion and caste do significantly influence life, living standards and welfare, studies on these factors relating to IT sector employees are very scarce in India. This is the research gap that is identified for this research paper, in the backdrop of the fact that the UN's UNDESA World Social Report[47] has noted that global inequality has grown together with the fast growth in technological innovation and technology adoption. IT being a sector that needs advanced technical knowledge and skills, IT sector is best for a socio-economic study, like the one attempted here.

5. Significance of the study

Even today inequalities persist among the employees in industries, including the IT industry. It is widely recognised in the literature that any development process should be holistic and equitable and this in turn demands an inequality-free employee profile. There should be adequate representation for every social group within the employees of any industry. This is particularly relevant for an industry like IT, since IT industry has a strategic role to play in Indian economy. Hence, there is high significance for studying the nature and extent of income inequalities among the IT sector employees, as IT sector demands highly technically-skilled manpower. So, the issue income inequality among IT sector employees is studied here.

6. Methodology of the study

In the study area (InfoPark, Kochi) a survey was conducted using a sample of 530 IT employees (Simple Random Sampling, Lottery method) with at least one year experience. The study was done in the last four months of FY 2019–2020. Secondary data were sourced from authentic sources, like, reports of Govt. of India (GOI), Govt. of Kerala (GOK), etc. The common statistical tool called Gini co-efficient (Gu) was used for data analysis. For group decomposition, deflated entry-level salary (2011–2012 WPI, Base year) was used. The co-efficient Gu was used to measure inequality using the equation of Yitzhaki[1] given below:

$$\text{Gu} = \sum_{i=1}^{n} SiGiOi + Gb \quad (1)$$

In the above equation for overall Gini co-efficient (Gu), $SiGiOi$ which is the 'within' component, accounts for the inequality existing within individual groups. In fact, this term $SiGiOi$, the within-group inequality, consists of three distinct components viz, (i) *Si* denotes the share of income on overall income for group *i*, (ii) *Oi* is the overlapping index of the entire population by sub-population *i*, and (iii) *Gi* represents the Gini of sub-population *i*. The term Gb is the 'between' component and it accounts for the inequality

across (between) the groups. *Gb* denotes the between-group inequality component for the 6 groups. Here, the IT employees are grouped into 6 on the basis of caste/religious groups. The overlapping is the total of the *pi*'s and the total product of *pj*'s and *Oji*'s. The overlap decomposition by Yitzhaki[1]is used to identify the overlapping of sub-population *i* and all sub-populations that comprise the union. In other words, total overlapping of sub-population *i*, that is *Oi*, is composed by the overlapping of all sub-populations including group *i* itself by group *i*. This further decomposition of *Oi* is:

$$Oi = pi + \sum_{j \neq i} pjOji \quad (2)$$

where $Oji = \frac{covi(y,Fj\,(y))}{covi(y,Fi\,(y))}$ is the overlapping of group *j* by group *i.* From this it follows that *Oji* is equal to zero if no member of distribution *j* lies within the range of distribution *i*, which means that group *i* is a perfect stratum. On the other hand, if over the range of distribution *i*, the shape of the distribution of group *j* is similar to the shape of distribution *i*, then *Oji* is equal to 1, and *Oji* is bounded from above by 2. And *Oji* is an index that measures the extent to which population *j* is included in the range of group *i. Gb* is the between group inequality and is shown below:

$$Gb = \frac{2\ cov\ (\mu i, Fui)}{\mu u} \quad (3)$$

wherein, μi is the mean income of each subpopulation and Fui is the sub-populations' mean rank in the overall population andμu is the overall expected income. That is, each sub-population is represented by its mean income, and the mean rank of its members in the overall distribution. The term *Gb* equals zero if either the mean incomes or the mean ranks are equal for all sub-populations. In extreme cases, *Gb* can be negative, which occurs when the mean income is negatively correlated with mean rank. Here, rank of mean monthly income is used by following the Pyatt[48] and Shorrocks[49] method, rather than using the mean of the ranks as done in the Yitzhaki's method.

7. IT sector in India with a focus on InfoPark at Ernakulam, Kerala: An overview

Though the population of India includes forty-nine percent of women, their participation is just 26.4 percent of the total workforce of the IT companies in India. Their share was still lower in 2008, when it was only 24 percent of the workforce. A joint study by NASSCOM and Indian Institute of Management-Ahmedabad (IIM-A) of December 2007 reported that almost 70 percent of women in the IT/ITES sector in India felt that attrition among women was not due to their incapability or incompetence at work but due to personal issues like familial pressures, inability to work for long hours, and the need for frequent travels. IT industry has been traditionally women-friendly with leading IT companies employing an almost equal number of male and female employees at the entry level. But, less than 10 percent of the top managers are women, even though at the entry-level women have 42 percent representation.

Kerala is one of the states' with highly educated people in the country but, at the same time experiences educated unemployment. Always, the private sector pays lesser wages to the employees than the government sector. With the growth of information technology sector, the educated youth got a chance to work in their homeland with comparably good remuneration. The development of SEZ's also helped the state become one of the major global destinations for IT-BPM companies. But, the excess pool of educated youth helped these companies pay low wages without any bargaining as they fear deployment. As, this excess pool of unemployed educated youth in Kerala may be a cause these companies provide only low wages even at the SEZ's. They themselves compare with peers and see some of them moving upward because of their specific advantages that they have. How many of them are competitive in this field is still a question. Whether issue of educated unemployment is solved and all are getting chances to grow in their career irrespective of the

specific social status or all categories of people are getting equal chances to be employed in the IT sector is sought to be analysed.

Social factors are the main cause of inequality in India as the upper castes grab most of the opportunities due to their dominance in the society. Kerala has the highest HDI among all the States in India and has a highly educated population who want high paying jobs in the industrial or service sectors. Now the human capital of Kerala is becoming more professional and is changing with the demand patterns. But, service sector dependency and growing supply of labour has reduced wages in this sector. Kerala has qualified professionals comparable with any other State in India and even with other nations of the world. Kerala's educated youth thrives for more employment avenues as their number grows year after year. The huge educated unemployment is one of the crucial problems that Kerala faces today.

Cochin SEZ (CSEZ) in Kakkanad at Kochi in central Kerala is the State's second largest IT park in Kerala. The study area for this study viz. InfoPark is located in the CSEZ locality. Another IT spot viz. Technopark in southern Kerala at Thiruvananthapuram, the State's capital city, has world-class IT infrastructure facilities. Now Kerala is one of the most promising IT destinations in the world for software development, BPO and ITES. Every year a growing number of educated youth come out of the colleges in Kerala, many of them with engineering degrees in IT, computer science, and allied branches; and also many MCAs. Government is giving training to these IT specialists to make them employable in IT sector. Government framed its policies through an IT mission which aims at creating 2 lakh vacancies in the IT sector. IT companies invest in Kerala because of the availability of qualified IT professionals at low cost in the State. IT infrastructure available at Technopark (Trivandrum), InfoPark (Ernakulam) and other IT parks are the main attractions for IT companies.

Besides the government-controlled parks like InfoPark, many private IT parks are creating more and more employment opportunities in Kerala. IT companies are spending huge amounts of money to train IT professionals in this State. Every fresh candidate is trained to make them employable. The majority of IT professionals are from urban middle class families with higher technological education. The professionals from SCs and STs have to compete with their peers to survive in this sector. One study on human resources by India's largest industry chamber, CII (Confederation of Indian Industry) revealed that the private sector companies in Tamil Nadu, Andhra Pradesh and Kerala have a remarkably high percentage of SCs and STs. In Kerala, the percentage of SCs/STs in the private sector is more than their share in Kerala population. This caste-based census was done among CII's 8250 member companies employing 35 lakh employees spread across 22 States and Union Territories.

InfoPark Kochi: In the year 2018–2019 there were a total 40,000 IT professionals through 392 IT companies who have space in its IT Parks. Of this, InfoPark Kochialone could contribute 32,000 job opportunities at the time of a survey among over 392 IT companies. InfoPark now employs about 15,000 professionals when the first phase of it is completed. The second phase of the park is expected to create about 80,000 jobs within eight years. InfoPark has also expanded its operations to Thrissur and Cherthala. The completion of the BPO complex creates 50,000 jobs this year. Cyberpark, Kannur and Kozhikode have also started working and creating more employment facilities in Kerala. InfoPark has 5 campuses which are spread over 322.98 acres and are under various phases of development. The details of the development of InfoPark, Kochi in five phases, based on Govt. of Kerala (GoK) data as of Jan. 2023, are (**Table 1)**.

Table 1. Land available with InfoPark.

Phases	**Phase I**	**Phase II**	**Thrissur (III)**	**Cherthala (IV)**	**TBC, Kaloor, Ernakulam (V)**
Area	100.86 Acres	125.92 Acres	30 Acres	66.2 Acres	30,000 sq. ft. (of KSITM) (On lease from GCDA)

Source: GoK (2023), Economic Review 2022[50], p. 220. (https://spb.kerala.gov.in).

8. Employees in IT sector in Kerala: Representation of various social groups

Kerala has always been a land of opportunities among all the states in India ever since the formation of the State in 1957. As per the 2011 Census, Kerala has a population of 33,406,061 including 17,471,135 rural population. The female population of 17,378,649 is more than the male population of 16,027,412, unlike in other States in India. Kerala's literacy rate of 92.1 percent is one of the highest in the whole of India with a very high share of educated youth. The highly educated population helped Kerala to reinforce its service sector, especially its growing IT sector, and services sector contributes more than 60 percent to Kerala's GSDP. Despite these positive features the share of job-seekers in Kerala is very high and is rising too. There is a clear indication of unemployment among engineering graduates which grew from 5.5 percent to 8.5 percent, during the period 2008 to 2012. As of February 2019, one-fourth of the engineering graduates in Kerala are unemployed and 66 percent got non-engineering jobs. As of September 2009 there were more than 1000 professionals employed in various firms at InfoPark and proved that, it is one of the growing IT destinations in India, especially with the increase in the presence of Indian IT giants like Wipro, TCS, etc. During 2018–2019 the total number of employees at InfoPark increased to 32,000 employees. It helped the individuals employed to earn a good income compared to the other available local professions. And the increase in the income levels of the IT professionals helped the emergence of another group of middle class in the economy. IT is a new area of work and this sector provided new jobs.

Every economy needs new job creation to reduce downward economic mobility considerably that is created with the idle resources. And this new job creation is a positive thing in that it will not affect the jobs of others as it doesn't have much Pareto negative effect. In view of the utmost significance of IT sector in Kerala economy, it is vital to study the caste pattern of employees in the IT sector so as to ensure that all the castes or social groups have an adequate share. Then only sustainability of this sector can be ensured. The lower castes get avenues for their social mobility. To solve this social equity issue, a decomposition analysis based on religion and caste is required in the Kerala context. As per the available data of the Govt. of India (GoI), in Kerala there are 54.73 percent Hindus, 26.56 percent Muslims and 18.38 percent Christians (**Table 2**).

Table 2. Religion-wise population of community in Kerala, 2011.

Sl. No.	Community	Total No. (Lakhs)	Percentage
1	Hindu	182.83	54.73
2	Muslim	88.73	26.56
3	Christian	61.41	18.38

Source: GoI (2011), O/o Registrar General & Census Commissioner.[51] (https://censusindia.gov.in/nada/index.php/catalog/42648)

It is noted that the SC/ST population Kerala State is much lower than that in India as a whole. In Kerala, it is 10.55 percent whereas it is 25.26 percent in India as a whole (**Table 3**). It is noted that the Gross Enrolment Ratio (GER) in higher education in Kerala is higher than that at the national level, and that too across all segments including SC/STs (**Table 4**).

Table 3. SC/ST population in Kerala and India as a whole (census 2011).

Particulars	Total population	SC population	ST population
Kerala	33,406,061	3,039,573 (9.10 percent)	484,839 (1.45 percent)
India	1,210,854,977	201,378,372 (16.63 percent)	104,545,716 (8.63 percent)

Source: GoI (2011), O/o Registrar General & Census Commissioner[51]. (https://censusindia.gov.in/nada/index.php/catalog/42648)

Table 4. GER in higher education (18–23 years)—India and Kerala (2015–2016) (percent).

State/India	All categories	SC students	ST students
Kerala	30.8	22.4	16.5
India	24.5	19.9	14.2

Source: GoI (2011), O/o Registrar General & Census Commissioner[51]. (https://censusindia.gov.in/nada/index.php/catalog/42648)

For this study 530 workers from InfoPark Kochi, Kerala were surveyed through Simple Random Sampling. The representation of various social groups in the IT jobs (InfoPark, Kochi) was found to vary from their share in Kerala's proportion (**Table 5**). It is noted that in a highly advanced sector in Kerala (viz. IT sector) the shares of SC/STs (5.09 percent) and Muslims (06.98 percent) are much lower than their share in Kerala's population (**Tables 2, 3** and **5**).

Table 5. Gini Decomposition of employees based on monthly income.

Sl. No.	Caste	Sample (percent)	Mean salary	Group Gini	Overlap
1	SC/ST*	27 (05.09)	12,481	0.34	0.11432
2	Muslim	37 (06.98)	12,560	0.25	0.162165
3	OBC	193 (36.42)	13,821	0.27	1.352343
4	Christian	129 (24.34)	14,066	0.27	0.903683
5	General	144 (27.17)	14,161	0.27	0.595102

Source: Field study. *SCs and STs were clubbed into one, being of similar status and also of low relative shares.

9. Analysis and discussion

In the higher level IT sector positions, Hindus are significantly higher (51.4 percent), followed by Christians (31.4 percent) and then Muslims (11.4 percent). The share of Muslims is much lower than their share in the State's population; and hence the highly paid employees are mostly Hindus and Christians. For getting a job in the IT sector higher education is a key prerequisite, and so also relevant training and proficiency in using English language. Regarding the enrolment in higher education, it is noted that enrolment by SC/ST students is better in Kerala than the national (all India) average. It may be noted that caste-based reservation is not provided in the private sector, and private sector companies prefer to have performance and profitability and are not bothered about social equity or distributive justice. Only the government-controlled institutions provide and support caste-based reservations.

In every society, economic mobility and inequality exist whether these are growing or not, but the pace of such phenomena may increase with development and growth. Economic mobility and inequality are inversely related. Surely, like economic mobility, social mobility also helps in reducing inequality. With the reduction in economic inequalities, economic mobility of a society may increase if it happens among the lower income people. The rise in income may bring social mobility to the particular groups if majority in that group is experiencing income mobility. If this increase is accompanied by less inequality then it is advisable for a developing economy, like India. As we know the IT sector is a great provider of individual income growth, the case of inequality is sought to be studied in this paper. Thus, this paper examines the inequality among the IT sector employees, by looking into the income inequality among various religious and caste groups with respect to InfoPark, Kochi.

Reduction in inequality and growth in economic mobility and social mobility is more advisable if the lower income groups face only low inequality. Here, this study considers the inequalities among the various religious and caste groups. The caste decomposition of income distribution (**Table 5**) helps to understand whether any group is experiencing more inequality compared to others. For this analysis, the caste/religion is

considered relevant at because social stigma plays a vital role in every field, and this aspect is not well researched in India's IT sector, especially in the Kerala context. As already noted, the Gini co-efficient of the population (Gu) is used for analysis using the equation of Yitzhaki[1] mentioned earlier as Equation (1). Here, Gu is the overall Gini co-efficient of the monthly income of the 530 sample employees of InfoPark, Kochi and its decomposition is found (**Table 5**). Thus. The Gini co-efficient for the 530 employees (Gu) is obtained as 0.28. When we look into the $SiGiOi$ component, i.e., the within the inequality component. This component denotes the inequality existing 'within' each group. It is $\sum_{i=1}^{n} SiGiOi$ = 0.25. The 'between' the groups inequality (Gb) = 0.03 denotes the inequality across the groups. So, Gu 0.28 = [0.25 + 0.03]. The highest Gini co-efficient goes to the group SC/STs (0.34), next comes OBC, Christian and General (0.27 each) which is nearest to the overall Gini co-efficient 0.28. Muslims have the least inequality (0.25). It is seen that overall inequality among the IT workers is low compared to the inequality of the Kerala State. It is noted that the mean salary is the highest for General category includes the upper caste Hindus and excludes the OBCs and SC/STs. The next highest is that of Christians. The least is that of SC/STs (**Table 5**). So, there is high inequality among Kerala's IT sector employees.

Overlapping index (Oi) shows the nature of stratification based on social variables and income level (salary), i.e., the extent of stratification of each group vis-à-vis other groups. Oi lies between 0 and 2. If the population share and overlapping index are the same for a group, that group forms a perfect stratum and the income of that group falls into the distribution of the whole population. If Oi is more than 1, it shows that polarization is formed within that group and that the income of the group members does not form a stratum, and it falls into the range of entire distribution. (e.g., very high Oi for OBCs and high Oi for Christians). Thus, as the Oi for OBCs is more than 1 (viz. 1.35) there exists polarization among OBCs. For the Christians too the Oi is very high and is close to 1 (viz. 0.90). It shows that the salary of the Christian IT professionals almost falls into the range of the entire distribution. In short, the salaries of the two groups (OBCs, and Christians) group do not form a stratum, but rather falls into the range of entire distribution. Two social groups, SC/STs and Muslims, show low values of overlapping index at the entry level jobs based on initial salaries; it shows least polarization at the entry into InfoPark. The perfect stratification criterion is not satisfied by any social group. With change in the population share, the overlap index changes. Sample size is a key factor while computing Gini co-efficient. SC/STs have the lowest share in the sample among the various groups and the highest (0.34) Gini co-efficient (top inequality). The main finding of this study is that high inequality exists among the employees in InfoPark, like, among SC/STs even though Kerala has one of the best IT infrastructures and technically qualified manpower in the whole of India. The above finding of this study supports the general observation in the UN's global report viz. UNDESA World Social Report 2020[47] which points out that inequality grows with technological base. That is, in line with the UN's observation even though Kerala State has high IT infrastructure, the empirical evidence (InfoPark) suggests high inequality. The need for initiatives for minimising the income inequalities among the various social groups through suitable affirmative actions can be inferred from the research findings above.

Given Kerala's strong IT infrastructure but the prevalence of high income inequality among the IT sector employees as revealed from this study, it is suggested that Kerala's IT infrastructure should be used to promote sectors like housing and tourism by IT-integration, as they have vast linkages and huge employment potential. Use of ICT in such sectors ensures fast, sustainable and equitable economic growth. (e.g., ICT-integrated ecotourism helps the rural masses, especially lower social strata). Affirmative action by the government in respect of its own regulated entities (REs) is advisable. Besides, similar affirmative actions even in the private (since IT companies are mostly in the private sector) is also desirable. Based on the

findings of this study after duly corroborating with findings of other similar research studies (like, the UNDESA World Social Report 2020[47]), the following are the major strategies suggested:

1) Suitable affirmative actions for minimising the inequalities among the employees in the IT sector, especially those with the highest inequalities (like, the SC/STs) be initiated by the Government (like, special recruitment drives, training courses, etc.).

2) Caste-based reservation and other affirmative actions be initiated in the private sector also, since despite the high IT infrastructure income inequalities persist in the IT industry and further most of the companies in the IT sector are in the private sector.

3) The huge IT infrastructure, including the technically skilled manpower in Kerala, should be duly leveraged by IT-integration in allied sectors, like, housing and tourism.

10. Conclusion

Economic mobility lags behind because of inequality among various social groups, and India is a glaring example. This empirical study suggests that even a highly socially advanced State in India (viz. Kerala) is no exception regarding such social inequalities. Division of the IT employees based on social status shows a higher 'social divide' than the 'digital divide', and this is evident from the very low mean salary of the lower castes people vis-à-vis their peers, and also a high Gini co-efficient that reflects this inequality. Minority representation is also very low in Kerala's IT sector. This study is only based on the entry level salary, but if we study further into the higher levels and also upward career mobility, the increasing inequality becomes more glaring. The representation in the advanced jobs is still lower.

To sum up, glass ceiling is not only for the women, but for the lower castes and religious minorities as well. Social inequalities should be got rid of in every industry, especially in a fast growing industry like the IT industry in India; because this industry is strategically significant and has a direct bearing on the pace of economic growth of this developing country. Besides promoting IT industry wide-spread use of IT/ITES be promoted in all sectors especially those having high linkages and employment potential, like, housing, and tourism. This ensures sustainable and equitable growth sans divides in the IT sector and also in the allied sectors.

Concludingly, the major limitation of this study is that it has considered only one major IT destination in Kerala viz. InfoPark in central Kerala. So, the other two IT destinations viz. the one at Southern Kerala (Technopark) and the other at Northern Kerala (Cyberpark) are beyond the scope of this study. There is scope for exploring this study into the two these two major destinations also. The research findings of this study have policy implications because the government can make suitable policy decisions, like, affirmative action for ensuring the representation of the disadvantaged groups (such as SC/STs) in the IT sector employees.

Author contributions

Conceptualization, CKS; methodology, CKS; software, CKS; validation, CKS; formal analysis, CKS; investigation, PKM; resources, PKM; data curation, PKM; writing—original draft, PKM; writing—review and editing, PKM. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

References

1. Yitzhaki S. On an extension of the Gini inequality index. *International Economic Review* 1983; 24(3):617–28.doi: 10.2307/2648789
2. Lerman RI, Yitzhaki S. A note on the calculation and interpretation of the Gini index. *Economics Letters* 1984; 15(3–4):363–368.doi: 10.1016/0165-1765(84)90126-5
3. Yu TT, Zhang MM. Income inequality among races: A statistical analysis. *South Western Economic Review Proceedings* 2005; 32(1): 31–40.
4. Upadhya C, Vasavi AR. *Work, Culture and Sociality in the Indian Information Technology (IT) Industry: A Sociological Study*. National Institute of Advanced Studies; 2006.
5. Dhillon M. Employee retention strategies—In Indian information technology sector. *International Journal of Management* 2020; 11(12): 1621–1629. doi: 10.34218/IJM.11.12.2020.148
6. Manoj PK. ICT industry in India: A SWOT analysis. *Journal of Global Economy* 2007; 3(4):263–282.doi: 10.1956/jge.v3i4.143
7. Subramanian D.A sociological profile of a public sector workforce. *Economic &Political Weekly* 2007; 42(51): 37–47.
8. Luke N, Thapa D. Mothers' economic mobility and children's education in South India: Reversing the caste and gender gap. In: Proceedings of the Education Preferences and Mobility Workshop, Development Research Centre on Migration, Globalization, and Poverty; 7–9 November 2007; Norwich, UK.
9. Deshpande R, Palshikar S. Occupational mobility: How much does caste matter? *Economic & Political Weekly* 2008; 43(34):61–70.
10. Pickens M. Window on the unbanked: Mobile money in the Philippines. Available online: https://www.cgap.org/ (accessed on 30 August 2023).
11. Wilson C. Understanding the dynamics of socio-economic mobility: Tales from two Indian villages. In: *eSocialSciences.* Overseas Development Institute; 2013.
12. Corak M. Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic Perspectives* 2013; 27(3):79–102.doi: 10.1257/jep.27.3.79
13. Manoj PK, John MP. Prospects of Cattle Feed Industry in India and Strategies for Utilizing the Market Potential: A Study in Kerala with a Focus on Factors Influencing Buyer Behaviour. *International Journal of Business and General Management (IJBGM)* 2014; 3(3): 1–12.
14. Manoj PK. Cattle feed industry in India: a macro perspective. *International Journal of Commerce and Business Management* 2015; IV(10)(I): 96–101.
15. Joju J, Manoj PK. Digital Kerala: A study of the ICT: Initiatives in Kerala State. *International Journal of Research in Engineering, IT and Social Sciences* 2019; 9: 692–703.
16. Asian Development Bank (ADB). *Gender Mainstreaming Case Study India: Kerala Sustainable Urban Development Project*. Asian Development Bank;2015.
17. Lauer K, Timothy L. Digital financial inclusion: Implications for customers, regulators, supervisors, and standard-setting bodies. Available online: https://www.documents.worldbank.org/ (accessed on 30 August 2023).
18. Manoj PK. Potential of micro enterprises in women empowerment: A critical study of micro enterprises run by women under the Kudumbashree Programme in Kerala. *International Journal of Business Policy and Economics* 2012; 5(2): 1–16.
19. Manoj PK. Information and communication technology (ICT) for effective implementation of MGNREGA in India: An analysis.In: *Digital Economy of India—Security and Privacy*. Serials Publications; 2012.
20. Nasar KK, Manoj PK.Customer satisfaction on service quality of real estate agencies: An empirical analysis with reference to Kochi Corporation Area of Kerala State in India. *International Journal of Management, IT and Engineering* 2013; 3(6):213–227.
21. James N, Manoj PK. Relevance of E-banking services in rural area—An empirical investigation. *Journal of Management and Science* 2014; 5: 1–14.
22. Manoj PK. Socio-Economic Impact of Housing Microfinance: Findings of a Field based Study in Kerala, India. *International Research Journal of Finance and Economics* 2015; 137: 32–43.
23. Manoj PK. Deterrents to the Housing Microfinance: Evidence from a Study of the Bankers to 'Bhavanashree' in Kerala, India. *International Research Journal of Finance and Economics* 2015; 138: 44–53.
24. Joju J, Vasantha S, Manoj PK. E-CRM: A perspective of urban & rural banks in Kerala. *International Journal of Recent Advances in Multidisciplinary Research* 2015; 2(9): 786–791.
25. Manoj PK, Viswanath V. Socio-Economic Conditions of Migrant Labourers - An Empirical Study in Kerala. *Indian Journal of Applied Research* 2015; 5(11): 88–93.
26. Rajesh S, Manoj PK. Women Employees work life and challenges to Industrial Relations: Evidence from North Kerala. *IPASJ International Journal of Management (IIJM)* 2015; 3(4): 1–8.

27. Manoj PK. Bank marketing in India in the current ICT era: Strategies for effective promotion of bank products. *International Journal of Advance Research in Computer Science and Management Studies*2016; 4(3): 103–113.
28. Manoj PK. Determinants of sustainability of rural tourism: a study of tourists at Kumbalangi in Kerala, India. *International Journal of Advance Research in Computer Science and Management Studies*2016; 4(4):17–30.
29. Manoj PK. Prospects and Problems of Housing Microfinance in India: Evidence from "Bhavanashree" Project in Kerala State. *European Journal of Economics, Finance and Administrative Sciences*2010; 19(19): 178–194.
30. Manoj PK. Impact of technology on the efficiency and risk management of old private sector banks in India: Evidence from banks based in Kerala. *European Journal of Social Sciences*2010; 14(2): 278–289.
31. Manoj PK. Benchmarking housing finance companies in India: Strategies for enhanced operational efficiency and competitiveness. *European Journal of Economics, Finance and Administrative Sciences*2010; 21(21): 21–34.
32. Manoj PK. Determinants of profitability and efficiency of old private sector banks in India with focus on banks in Kerala State: an econometric study. *International Research Journal of Finance and Economics* 2010; 47: 7–20.
33. Lakshmi, Manoj PK. Service quality in rural banking in north Kerala: A comparative study of Kannur district co-operative bank and Kerala Gramin bank. *International Journal of Applied Business and Economic Research* 2017; 15(18): 209–220.
34. Lakshmi, Manoj PK. Rural Customers and ICT-based Bank Products A Study with a Focus on Kannur District Co-operative Bank and Kerala Gramin Bank. *International Journal of Economic Research* 2017; 14(14): 423–434.
35. Joju J, Vasantha S, Manoj PK. Future of brick and mortar banking in Kerala: Relevance of branch banking in the digital era. *International Journal of Civil Engineering and Technology* 2017; 8(8): 780–789.
36. Joju J, Vasantha S, Manoj PK. Financial technology and service quality in banks: Some empirical evidence from the old private sector banks based in Kerala, India. *International Journal of Applied Business and Economic Research* 2017; 15(16): 447–457.
37. Manoj PK. Construction costs in affordable housing in Kerala: Relative significance of the various elements of costs of affordable housing projects. *International Journal of Civil Engineering and Technology (IJCIET)* 2017; 8(9): 1176–1186.
38. Manoj PK. Cost management in the construction of affordable housing units in Kerala: A case study of the relevance of earned value analysis (EVA) approach. *International Journal of Civil Engineering and Technology (IJCIET)* 2017; 8(10): 111–129.
39. Joju J, Vasantha S, Manoj PK. Electronic CRM & ICT-based banking services: An empirical study of the attitude of customers in Kerala, India. *International Journal of Economic Research* 2017; 14(9): 413–423.
40. Manoj PK. CRM in old private sector banks and new generation private sector banks in Kerala: A comparison. *Journal of Advanced Research in Dynamical and Control Systems* 2018; 10(2): 846–853.
41. Manoj PK. Social banking in India in the reforms era and the case of financial inclusion: Relevance of ICT-based policy options. *Journal of Advanced Research in Dynamical and Control Systems* 2019; 11(7): 1654–1666.
42. Manoj PK. Dynamics of human resource management in banks in the ICT era: A study with a focus on Kerala based old private sector banks. *Journal of Advanced Research in Dynamical and Control Systems* 2019; 11(7): 1667–1680.
43. Manoj PK. Competitiveness of manufacturing industry in India: need for flexible manufacturing systems. *International Journal of Innovative Technology and Exploring Engineering* 2019; 8(12): 3041–3047. doi: 10.35940/ijitee.K2452.1081219
44. Ali OP, Manoj PK. Impact of Falling Price of Rubber-A Case Study of Kothamangalam Taluk in Ernakulam District. *Indian Journal of Economics and Development* 2020; 16(1): 118–124.doi: 10.35716/ijed/19142
45. United Nations. Digital financial inclusion. Available online: https://www.un.org/esa/ffd/wp-content/uploads/2016/01/Digital-Financial-Inclusion_ITU_IATF-Issue-Brief.pdf (accessed on 19 September 2023).
46. Official website of NASSCOM. Available online: https://www.nasscom.org (accessed on 31 May 2023).
47. United Nations. UNDESA world social report 2020. Available online: https://www.un.org/development/desa/dspd/world-social-report/2020-2.html (accessed on 30 August 2023).
48. Pyatt G. On the Interpretation and Disaggregation of Gini Coefficients. *The Economic Journal* 1976; 86(342): 243–255. https://doi.org/10.2307/2230745
49. Shorrocks AF. Inequality decomposition by population sub-groups. *Econometrica* 1984; 52: 1369–1385.
50. Government of Kerala. Economic review 2022. Available online: https://spb.kerala.gov.in/sites/default/files/2023-02/ENGLISH%20FINAL%20PRESS%2004.02.2023_0.pdf (accessed on 19 September 2023).
51. C-01: Population by religious community, Kerala-2011. Available online: https://censusindia.gov.in/nada/index.php/catalog/11379 (accessed on 19 September 2023).