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# Covid -19 and Yawning Social Disparities in India

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## ABSTRACT

**The pandemic of covid-19 has paved way to strengthen the already existing, deep rooted inequalities and stratification. It has led to emergence of "digitally advantaged' and "digitally disadvantaged" category of "Have" and "Have-nots". These socio- technical disparities are overblown through various levels of exclusion in the name of social distancing leading to increase marginalization and vulnerabilities of certain sections of society than others. Most of these inequalities are perpetuated through access to digital technology. Thus the existing stratification of Indian society based on caste, class, economy and gender got furthered in another form through digital stratification based on distribution and access to resources across nation and boundaries. The widening of disparity between the have and have-nots was evident through their socio- economic status backed by their stratified identities based on caste class and gender. The pandemic significantly contributed towards widening the already prevailing and accelerating inequalities amongst the masses. This accelerating inequality has also led to sub division amongst the informal workers placing some at higher risk than others. The COVID-19 pandemic has played a significant role in highlighting yawning inequalities. It has wide- open the myth that everyone had to face same hardships and was sailing in the same boat. While no one could escape from its clinches it is evident by now and goes without saying that some were minorly affected and could get back to normal routine quickly whereas others were badly affected and are yet struggling for survival. It is just that we has ignored and bared these inequalities since very long and pandemic has sharpened its edges even more jeopardizing the financial weaker sections of society.**

**Key Words: Social stratification, Digitally advantaged, Digitally disadvantaged.**

## INTRODUCTION

**Structural functionalists** argue that social inequality plays a vital role in the smooth operation of a society. The **Davis-Moore thesis**[1] states that social stratification has beneficial consequences for the operation of society. However, sociologists recognize that social stratification is a society-wide system that makes inequalities apparent. While there are always inequalities between individuals, sociologists are interested in larger social patterns. Stratification is not about individual inequalities, but about systematic inequalities based on group membership, classes, and the like. No individual, rich or poor, can be blamed for social inequalities. The structure of a society affects a person's social standing. Although individuals may support or fight inequalities, social stratification is created and supported by society as a whole.

The pandemic of covid-19 has paved way to strengthen the already existing, deep rooted inequalities and stratification. It has led to emergence of "digitally advantaged' and "digitally disadvantaged" category of "Have" and "Have-nots". These socio- technical disparities are overblown through various levels of exclusion in the name of social distancing leading to increase marginalization and vulnerabilities of certain sections of society than others. Most of these inequalities are perpetuated through access to digital technology. Thus the existing stratification of Indian society based on caste, class, economy and gender got furthered in another form through digital stratification based on distribution and access to resources across nation and boundaries.

### Covid – 19 and Widening Social Disparity in Indian Society

The public health system in India is known to be neglected over a long period of time and has been battling hard to cope with ill equipped health and transmissible diseases like TB, Pneumonia, Diarrheal diseases, etc., In early 2020 Covid – 19

[1]Davis-Moore thesis. (2013).In K. Bell (Ed.), Open Education SoiolgyDictionary. Retrieved from https://sociologydictionary.org/davis-mmre-thesis/

emerged as an addition lethal respirational disease[2];[3].We find that the majority of Indian states are least prepared for the COVID-19 pandemic from a public health perspective of having all the necessary physical infrastructure in place which enables people to stay indoors and also maintain physical distancing safely if outdoors.

The rural, urban and tribal population of India by now has been vulnerable, deprived and slogging for decades. Loss of job and non-availability of resources during Covid – 19 and the consequent lockdown led them suffer with severe financial crunch. The ill equipped infrastructure of public health and medical staff's inability to deal with the situation was unambiguous. Also otherwise the failure of neoliberal policies in creating jobs for the masses, implementing social security measures and lack of funding in health sector have contributed to widening of socio- economic and health inequalities amongst the masses[4],[5],[6],[7].

Indian society has long witnessed social distancing incised through caste system via notion of untouchability, purity and pollution. The upper castes through numerous customs, traditions, rituals and practices have ensured social distancing with castes, lower in the hierarchy with regard to food, water, marriage, occupation apart from civil and religious disabilities[8];[9]. Now India is facing the challenge of inequality and the economic devastation caused by the COVID-19 pandemic. The imposition of long months of lockdown severely affected the already battling economy of the country which had to confront with increase joblessness, low rate of growth coupled with waning consumption expenditure[10].

Though the mechanism of social distancing was a positive move and indeed significant but such procedures are hazardous as either they need to risk their life or lose the earning. Thus despite being unreasonable and impractical the essential staff continue to work without any form of social security.

These social distancing and isolation policies though were the important strategy to battle against Covid -19, left numerous families without any option other than starvation and hunger. It was not just the poorest of the poor even well to do families relying on day to day trading were harshly affected. The severity of the pandemic is largely determined by access to the basic necessities for the poor households who are at the highest risk of the pandemic. (Kannabiran, 2020)[11] has made reference to various discriminatory practices like blaming of certain communities and stigmatization of the migrant laborers, poor and the people residing in slums. Maintaining social distancing was a real challenge in crowded localities such as slums. There are more than 13 million slum households as per the 2011 Census of India. About half a million of such households are dilapidated[12]. The poor are vulnerable even in normal circumstances, with the social determinants of health being particularly compromised. It is unrealistic to expect slum residents to maintain social distancing in crowded living conditions.

The attitude of the neighbors and surrounding towards the person and the family under quarantine due to suspecting them to be the carrier also needs a special mention. A large majority of covid survivors had to face stigmatization from neighbours

[2]Dasgupta, M. (2005). Public health in India: Dangerous neglect. *Economic & Political Weekly*, 40(49), 5159–5165.
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and residence of the complex, they were not only looked down upon but de valued too. In fact they were being ostracized and rejected socially.

Even the different quarantine transit arrangements for international and domestic passengers and for people belonging to different layers of supported the imposed hierarchies of Indian society. Though it was clear that the virus was brought by the so called well off and elite of the society and it was difficult to trace the intensity of its spread amongst different communities, its swift spread was attributed to the poor communities. The Oxfam report[13] finding also supported its prevalence amongst the poor, marginalized and vulnerable communities where people were living in cramped areas with poor sanitation and using shared common facilities such as toilets and water points.

The restriction of entry of maid servants in the society was sufficient to explain the discriminatory practice. It is interesting to note while the daily helpers like maids, local vendors and delivery boys were denied entry into housing societies the sweepers and cleaners continue to provide their services. While local train functioned only for people working in essential services for months the bus resumed much erlier than local trains, witnessed long hours of waiting and travelling for the whole day. Though 30 passengers with 5 standings were permitted in the bus, social distancing norms were violated most of the time. It is very much clear that more than the fear of pandemic people were anxious about scheduling their working hours to avail services to reach their workplace. It was all about their survival.These "Have Nots" are trapped in adverse equilibrium with no other choice then to risk their life by reporting to work and risking their wages if they don't report to work. Thus it was evident that in the name of health social equity and justice was compromised.

In case of Covid the discrimination was witnessed with regard to people who were perceived as the perpetual carriers of the virus. The furtherance division of country into red, orange and green zone based on the intensity, death and transmission defined the rules for physical movement for the locals along operation of business and economic activities in the respective zones. Most of which had come to a stand-still[14]. These unprecedented economic and medical challenges adversely impacted production, employment of national economies and global trade. As per the report of Oxfam around 75% of worker lost their jobs in informal sector since the sector did not support any option like work from home. The complete lockdown also affected the earning opportunities for a large number of migrant labour working at factories and construction sites. While the rich manage to escape from the nastiest impact of pandemic due to their quick adaption to technology since they "Have" better access to resources left any "Have-nots" without and income generating opportunity to support their family. It is ironical to state that while majority had to face hardship and struggle for survival the wealth of the Indian billionaires accelerated by 35% positioning India at sixth rank.

A clear cut three layered stratification was evident in the society comprising of "Tech Giants" with advanced knowledge of technology along with better accessibility to resources did not get affected at all due to pandemic. The second category comprised of those who were better off to quickly adapt to digitalization with making use of available resources and shifted to work from home. Majority of them belonged to teaching fraternity and formal workforce working in corporate and offices. A majority of them faced salary cuts upto 50% with fewer exceptions in permanent govt. jobs. When the lockdown eased a little they started reporting once or twice to their workplace and otherwise continue to manage work from home. They somehow managed to adapt to the uncertainties to ensure possibilities in unanticipated change. People were coerced to shift to online platforms like Zoom, Meet, and Teams etc. For this group it was taken as positive uncertainty which provided them the confidence to be flexible.

Third category were those who worked in informal sector, in construction, the migrant labourer, daily wage earners etc. who were the worst affected of the digital divide and whose working conditions were just not conducive for any option of work from home. A large number of migrant workers under covid -19 were suddenly jobless especially those working on contractual or daily basis. The International Labour Organisation(ILO Monitor, 2020), estimates that around 1.6 billion workers belonging to informal sector have lost their jobs. The worst affected were those working in essential services who couldn't avoid physical labour and face to face interaction. Ironically most of thembelonged to medical services, the bus drivers, delivery boys, sweepers and the garbage collectors who were exposed to the major health risks.

"Haves" were digitally privileged to continue receiving the health and income benefits while a large section of digitally disadvantaged "Have-nots" from informal sector were worse affected on all fronts. The haves had little or nothing to lose

[13]https://www.oxfam.org/en/research/inequality-virus
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whereas the have not were at a greater risk of losing everything since majority of them hail from highly congested localities tagged as contaminated zones. For these workers, social distancing was contradictory to the very nature of the job. Wishing to keep a 'safe distance' from people by staying at home would mean losing income, perhaps the job altogether[15].

The widening of disparity between the have and have-nots was evident through their socio- economic status backed by their stratified identities based on caste class and gender. The pandemic significantly contributed towards widening the already prevailing and accelerating inequalities amongst the masses. This accelerating inequality has also led to sub division amongst the informal workers placing some at higher risk than others.

Over the past year as education shifted online, India saw the digital divide worsening inequalities. The pandemic also sharpened education inequalities.Apart from adults, children too had to thrive on routine to dramatically shift to new methods of online teaching.On the one hand, private providers such as BYJU's (currently valued at $10.8 billion) and Uncademy (valued at $1.45 billion) experienced exponential growth yet, on the other, just 3 per cent of the poorest 20 per cent of Indian households had access to a computer and just 9 per cent had access to the internet[16].The long disruption of schooling has doubled the risk of drop outs especially amongst the poor. Two upsetting realities were brought into public domain by The Annual Status of Education Report (Aser). Firstly only less than one third of the school going children have access to online learning since during lockdown that's the only mean available to the student fraternity. Secondly inspite of availability of smartphones in the family many couldn't access the online classes[17].

Thus the pandemic has viciously uncovered the yawning digital divide in the country which was always existing but never recognized. It goes without saying that schooling interruptions reduce learning opportunities. Further the Have-nots had either no or little prospect to learn. The extensive loss of human capital is more injurious than the financial wounds leading to eternal loss of out. For us it has aggravated the already yawing inequalities and most of it is irreparable.

After the lock down is waived off and pandemic is gone, the "Haves" - digitally privileged having all access to technology and resources will be right back to their routine with their health, wealth and job intact[18].

## CONCLUSION

The COVID-19 pandemic has played a significant role in highlighting yawning inequalities. It has wide- open the myth that everyone had to face same hardships and was sailing in the same boat. While no one could escape from its clinches it is evident by now and goes without saying that some were minorly affected and could get back to normal routine quickly whereas others were badly affected and are yet struggling for survival. It is just that we has ignored and bared these inequalities since very long and pandemic has sharpened its edges even more jeopardizing the financial weaker sections of society.

Social distancing can never be attained unless the people have the resources to survive. It resulted in obvious under nutrition amongst poor people who were already vulnerable due to starvation. All the guidelines of social distancing like avoiding physical contact, staying home, avoiding religious and social gatherings, restricting leisure and travel was feasible only to one segment of population who were financially sound to sustain themselves, could avail delivery of grocery and medicines to their doorsteps, could use digital technology to stay in touch and avail essential through online mode. However there has also increased the threat of increasing social rejection, growing impersonality and individualism and loss of sense of belonging.These are the stumbling blocks in the way to progress and development of the country.

[15]Neethi P. and Anant Kamath. (2020)-https://science.thewire.in/health/how-the-coronavirus-outbreak-is-also-a-socio-economic-inequality-issue/)
[16]https://indianexpress.com/article/india/covid-deepened-inequalities-wealth-education-gender-7160341/
[17]*Anil Padmanabhan* Covid-19 rewrites the inequality, poverty dynamics
[18]https://www.livemint.com/opinion/columns/covid-19-rewrites-the-inequality-poverty-dynamics-11604285129234.html

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# STRUCTURE AND ROLE OF REGIONAL TRANSPORT OFFICE IN MAHARASHTRA

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***Abstract***

*The administration, execution and compliance of the provisions of the Motor Vehicles Act, 1988 is the responsibility of the Maharashtra government and this responsibility is carried out through their Regional Transport Office/Regional Transport Authority. Motor Vehicles Departments have been created under the Motor Vehicles Act, 1988, to manage these tasks and to enforce regulations, tax laws and tax laws on passengers, etc. Thus this project attempts to review the structure and role of RTO in Maharashtra with a view to analyze its socio-economic importance to the state. It was discovered that rapid urbanization and constant growth in road transportation have put immense pressure on the Motor Vehicles Department to improve its physical and operational functioning in order to provide efficient service to the citizens on one end and enforce the provisions of the Motor Vehicles Act 1988 on the other end. Likewise, the vehicle ownership for two-wheeler, four-wheeler, etc. is constantly increasing for fast transit. At the same time, there has been a rise in population, road congestion, number of injuries, air pollution, noise pollution, etc., which has led to an immense increase in the work of upgraded communication systems, road vehicles, registration of vehicles, inspections, driver's licenses, etc. and other services related to road transport. Similarly, government laws should be enforced to regulate road vehicles and impose stricter environmental regulations. There is an urgent need for capacity building and research, strengthening and enabling the legal, operational and financial framework for road safety in order to keep pace with growing demands due to rapid urbanization, and the role of the government is crucial in the planning and strict implementation of safety measures.*

***Keywords:*** Maharashtra, Road Transportation, Regional Transport Office, Structure, Role, Registration, Driving License, Road Accidents, Enforcement, Motor Vehicles Act, 1988.

## 1. *Introduction*

### ❖ *Regional Transport Offices (RTOs)*

The Government of India is responsible for keeping a record or database of all vehicles used and drivers in India and, through its Regional Transport Office/Regional Transport Authority, each state and union territory is responsible for retaining this responsibility. To look after the record maintenance as well as issuance of driving license, permits and registration certificates, the Motor Vehicles Department was devised under section 213(1) of the Motor Vehicles Act, 1988.The Motor Vehicles Department controls the imposing of various requirements of this Act. The head of the department is the Transport Commissioner who supervises all the activities and safeguards the data relating to vehicles on Indian road, issuance of driving license and permits and other related certifications.

Each state and union territories in India has a number of Regional Transport Offices (RTOs) that handle the registration, permits and driving license processes in that state and union territories. Usually, each district of a state has an RTO that will keep a track of the registered vehicles and driving license obtained by individuals in that locality. There are more than 1,100 RTOs in the country and the Ministry of Road Transport and Highways wishes to computerize all the data store by the RTOs for easy access and maintenance.

### ❖ **Objectives of the Study**

The goals of this research review are the following:

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# SEIZED VEHICLES MANAGEMENT BY POLICE AND RTO IN MUMBAI: A REVIEW

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***Abstract***
*Vehicles are at the centre of every debate in India because of their private or industrial use, traffic, and emissions. The rate of growth in car ownership in urban areas is faster than the rate of increase in rural areas. Impounded and disowned vehicles are not a recent problem, nor are they exclusive to Mumbai. Mumbai is one of India's fastest growing cities, and city leaders are pushing hard to make it even better in the future. However, Mumbai's problem is a shortage of land, as the city is extremely congested. The aim of the research is to learn more about the current state of the Regional Traffic Office's management of abandoned and confiscated vehicles in Mumbai. In every state Motor Vehicles Department was established under the provisions of section 213 of the Motor Vehicles Act, 1988 to carry out all motor vehicle-related operations and to administer the MV Act's provisions. Due to rapid urbanisation, an increase in the number of vehicles on the road, and an increase in the number of road deaths, the number of vehicles confiscated by RTO is also on the rise, posing a complicated and complex issue for society, and its inappropriate management has serious consequences for public health and the environment. The environmental effects of waste generated by a growing number of junk cars has become a serious threat in the global scenario.*

***Keywords***: Impounded, unclaimed and seized vehicles, Regional Traffic Office, police station, traffic violation, auction, parking yards, seizure, retention and disposal, scrap

## *I. INTRODUCTION*

Due to industrial development in India, there is a huge strain on transport services in rural and urban areas. Likewise, two-wheelers, four-wheelers and other private and commercial vehicles are constantly increasing for fast transit. At the same time, the increase in road congestion, increase in number of accidents, air and noise pollution etc. are also taking place in particular. Motor Vehicles Department carry out the function of management, implementation and enforcement of the provisions of the Motor Vehicles Act, 1988 through establishment of RTO/RTA at various District. There has been a huge increase in the work of RTO related to updated communication services, road vehicles, air pollution, vehicle registration, inspections, driver's licenses etc. Motor Vehicles Departments have been entrusted to handle these tasks and to enforce rules, tax laws and passenger tax laws, etc. In Maharashtra, the Acts and Rules that govern the motor vehicle department are MVA, 1988, CMV Rules, 1989, Maharashtra MV Act & Rules, Road Transport Acts & Rules, etc.

### *1.1 OBJECTIVE OF THE STUDY*

Research has been carried out by the researcher with the following objectives

1. To analyse the procedure of seizure, retaining and disposing of confiscated vehicles by RTO in Mumbai
2. To find out if there is any space allotted by the government for parking of seized vehicles
3. To analyse the overall impact of seized, unclaimed and abandoned vehicles lying for a longer period

### *1.2 SCOPE OF THE STUDY*

The study intends to evaluate the role of Police and Regional Transport Office in terms of the procedure to be followed in managing the vehicles seized in Mumbai. The study is confined to few Police Stations in Mumbai Region.

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# 'Accessibility and Pitfalls of Hybrid Learning - How the Pandemic Changed Dynamics of Education in India'

**Prof. Shaikh Shahida**

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## ABSTRACT

**The nationwide lockdown in India began on 24th of March in 2020 after the deadly 'Covid – 19' virus doomed its way to India and has since resulted in socio – economic, political and psychological changes while it created a domino effect on educational courses. As the virus spread across the world and India, it affected all societies on a distinct level. This in flux created a major setback for the academic year of 2020, both – for the teachers and the students. The educational fabric of India thrives on interactive classes. The 'distancing' that was celebrated as a measure and precaution to avoid the novel corona virus became a challenge for educational institutes for providing the best teaching and learning experience for the students. In the wake of the lockdown last year in 2020, educational institutions across the world had to shift classes online and incorporate digital learning and assessment techniques into the curriculum. The brick-and-mortar schools in a developing country like India were unprepared for this sudden change where learning practices had to collapse and turn overnight. It emerged as a panacea to sustain the educational crisis during lockdown as all one needed was a computer, tablet or smartphone and a good internet connection. The drawback of easy' onthego'–online education, as a hybrid to the whole idea of classroom teaching and human interaction, turned accessibility and availability into a weak link of the bridge. Before the idea of 'online classes' could curlicue, the lack of 'technological use' and access to better quality of learning experience excluded all students. With constant internet bans, economic frivolity and lockdown, the curriculum, faculty, administration and students worked with what they had, while avoiding pitfalls of the socio – economic balance. The paper discusses the ambiguity and aperture of socio – economic, political and psychological change and thrust, with direct impact on education and academics, caused by the pandemicnationwideandalsoelucidatesthechallengesfacedbytheteachersandthestudents.**

**Keywords: Academic, Pandemic, Education, Technology, Hybrid**

## INTRODUCTION

In December of 2019, COVID- 19, which is caused by a new strain of coronavirus, rose out of Wuhan city in China, which World Health Organization termed a 'pandemic'. With unstable environment and the deadly nature of the virus, all countries suffered a loss of business activities, and loss of employment. It halted a large number of economic activities because of infectious nature. On June 24, 2020, there are around 9,129,146 cases globally out of which 4,73,797losttheirlives.[1]India is on the fourth place in the number of confirmed cases and first in Asia. Total confirmed cases in India are 4,56,183out of which14,476 lost their lives mainly in the states Maharashtra and Delhi (Ministry of Health and Family Welfare,GOI).

The outbreak of COVID-19 dismantled all social, economic and political functions of the world. It further created a hollow impact on the psychological aspects of the citizens after the governments around the world, temporarily shut all educational institutions and academic centres in an attempt to contain the spread of the virus, effectively calling it a 'pandemic' all overtheworld.ThegovernmentofIndia,announcedanationwidelockdownasaconsequence of which, the economy and academic faced a large set-back in all societal aspects of the country.

Impacting over 91% of the students all over the world, the worldwide lockdown changed the meaning of 'education' that was earlier limited to physical contact and learning. While developed countries in the west took on the idea of 'hybrid' learning with a fast pace, the less developed and developing countries faced hinderance because of all political and economic factors. The implemented idea of localized closures impacted millions of additional learners, ranging from school going children to postgraduate students, from clerks of the institution to professors.

Apart from the health and economic crisis, the psychological aspect of the pandemic posed to be a major challenge to every country hit under lockdown. Due to lockdown, mass unemployment, the collapse of various businesses, loss of

income, increasing inequalities and poverty, deaths, less mobility, and so forth created a huge impact on the mental status of people.

From older to younger, rich to poor, everyone was affected. This outbreak resulted in additional health issues like anxiety, stress, depression, anger, fear, and so forth, globally. (Torales, O'Higgins, Castaldelli- Maia, and Ventriglio, 2020)

India initially proclaimed a one- day "*Janata Curfew*" on March 22, 2020. From there on, a total lockdown was reported in India at first for 21 days which was extended to an additional 19 days, and thereafter it got broadened further with minor relaxations. After June 1, many relaxations were given to proceed with the economic activities but borders of some states are sealed even now depending on the severity of the health crisis in a particular state. All the economic activities were provided some relaxations after a complete halt on them but an unprecedented loss already occurred and the economy of India shook with a new low.

UNESCO supported countries in their efforts to mitigate the immediate impact of school closures, particularly for more vulnerable and disadvantaged communities, and to facilitate the continuity of education for all through remote learning. The UNESCO report estimates that the corona virus pandemic will adversely impact over 290 million students across 22 countries. The UNESCO estimates that about 32 crores students are affected in India, including those in schools and colleges.

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# COMPARATIVE STUDY OF AGRICULTURAL DEVELOPMENT OF STATES IN INDIA

Dr. Dattatraya Vitthalrao Parhad*

## ABSTRACT

The study reviewed six agricultural development indicators to analyze the status of development of different states in India. The researcher has studied the data for the year 2016-2017. The data is analyzed using Principal Component analysis method using SPSS Software.

The states are ranked on the basis of development and further classified into Developed, Developing and Low developed states.

The study revealed that most of the developed states are Punjab and Haryana and low developed state Mizoram. Nagaland stood first in the developing states while Sikkim is last in that list.

This Research Paper is a part of a Minor Research Project funded by University of Mumbai.

**Keywords :** Principal component, Development, India, State, Ranking , Agriculture

## Introduction

Agriculture in India has a long history of around 11000 years. The farming started with the help of the plants and animals. Before 6500 years from now, in Indus civilization, irrigation was developed with the help of drainage and sewers. In the period of 2800-1500 BCE , the era of ashmound, they grew millets and pulses and also herded cattle, goats and sheep.

In the Iron era, the civilians started cultivating Kharip as well as rabbi crops. The Mourya empire categorizes soil and made metallurgical observations. In early common era , Indians had started cultivating the crops like sugarcane, coconut , jackfruit, millets and peppers. In Mughal era, Sher Shah Suri started agricultural reforms and Akbar continued the same. Few Indian commercial crops such as Cotton, indigo, opium, wheat, and rice made it to the global market under the British Raj in India.

After independence, Some programmes were designed to improve food and cash crops which finally resulted into famous five year plans. Many production revolutions such as Green revolution, Yellow revolution , operation Flood and blue revolution were initiated and that showed significant growth in agricultural production.

India is still depends on agricultural sector and more than 50% population is depend on the agriculture and allied sectors. Apart from the centers policies for improving agricultural production and irrigation facilities, the Indian state government are also taking different measures for improving this sectors. But , In recent years, due increase in service and industrial sectors, Agriculture is hardly adding 15 to 20 % contribution to India's GDP.

The study has been made to rank the different states and classify them on the basis of agricultural development.

Presently, India has 29 states and 7 union territories. Due to unavailability of the data for many indicators, Telangana is not considered as separate state in this study.

**Objectives :-**

1) To analyze the Statistical data for measuring the level of Agricultural Development of the states of

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Principal component analysis reduces the dimensionality of a set of data while trying to preserve the structure. Principal components can be used to reduce the number of variables in statistical analyses. The mathematical technique used in PCA is called eigen analysis: we solve for the eigen values and eigenvectors of a square symmetric matrix with sums of squares and cross products. The eigenvector associated with the largest eigenvalue has the same direction as the first principal component. The eigenvector associated with the second largest eigenvalue determines the direction of the second principal component. The sum of the eigenvalues equals the trace of the square matrix and the maximum number of eigenvectors equals the number of rows (or columns) of this matrix.

Consider a multivariate data matrix

$V=[V_{ij}]$

$i=1,2,3,\ldots\ldots\ldots,n$

$j=1,2,3,\ldots\ldots\ldots,k$

Where Vi denote the cases and Vj denote the variables (or indicators)

Let the matrix V be normalized using formula

$$U_{ij} = \frac{V_{ij}-V_j}{\sigma_j}$$

Where $V_j$ is Mean of $V_{ij}$ and $_j$ is Standard deviation of $V_{ij}$

Let

$Z=[z_{ij}]$ ----------(ii)

where $i = 1,2,3,\ldots\ldots\ldots k$

and $j = 1, 2,3, \ldots\ldots\ldots k$

be correlation matrix of U and it is a symmetric matrix of order k.

Consider equation

$$ZW = \lambda W$$

where $\lambda$ is called eigen value of Z and W is called eigenvector or latent vector of Z.

$\lambda$ is the root of equation

Let

$W=[w_{ij}]$

$i=1,2,3,\ldots\ldots\ldots\ldots k$

$j = 1,2,3,\ldots\ldots\ldots\ldots k$ ...(iii)

be the matrix of eigenvectors such that $\lambda_1 \geq \lambda_2 \geq \lambda_3 \ldots\ldots\ldots \geq \lambda_k$ This matrix is also called the matrix of factor loadings.

Let $\lambda_1, \lambda_2, \lambda_3, \ldots\ldots\ldots \lambda_m$ be the values greater than or equals to 1.

Consider a matrix

$M=[m_{ij}]$ $i=1,2,3,\ldots\ldots k$

$j = 1, 2, 3,\ldots\ldots k$ be the matrix of first k eigen vectors.

Then principal Component Score $P_{ij}$ is calculated by the formula

$$P_{ij} = \frac{\sum m_{ij} \cdot U_j^T}{\sigma_j}$$

where $m_j$ = factor loading of first component on j the variable.

$U_j^T$ =normalized value of j the variable

$\sigma_j$ = S.D. of $j^{th}$ variable.(this value is 1 for normalized data)

$P_{1j}$ is called first principal component score.

Similarly $P_{2j}, P_{3j}, \ldots\ldots\ldots P_{mj}$ can be calculated as principal Component score for $2^{nd}$, $3^{rd}$, ……, $m^{th}$ Principal Components. These principal Component scores (PC scores) are used as data for further analysis.

Since these scores carry negative signs, for further analysis to form Composite principal scores, a constant, which equals to the maximum magnitude of negative number in the same data, is added in all the respective principal component score.

The composite principal component score (CS) is calculated by the formulas.

$$CS = \frac{\sum p\lambda}{\sum \lambda}$$

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# FIVE YEARS OF OVER-ALL SOCIO- ECONOMIC DEVELOPMENT OF STATES OF INDIA: 2012-2013 TO 2016-2017

❒ Dr. Dattatraya Vitthalrao Parhad*

## ABSTRACT

The study reviewed 72 socio-economic development indicators to analyze the status of socio-economic development of different states in India. The researcher has studied the data for the year 2012-2013 and 2016-2017. The data is analyzed using Principal Component analysis method using SPSS Software. The states are ranked on the basis of development and further classified into Developed, Developing and Low developed states. The study revealed that most of the developed states are from central or south India and low developed states are from hilly area. Delhi stood first in the ranking while Jammu and Kashmir found in low developed states in both the time periods. This Research paper is a part of a Minor Research project funded by University of Mumbai.

**Keywords :** Principal component, Development, India, State, Ranking

## Introduction

India became an Independent country on 15th August 1947.The constitution of India was adopted on 26th November 1949 and it came into force from 26th January 1950.

At the time of Independence , the country was divided into 562 princely states and 17 provinces.

After independence Between 1947 and 1950, by then Central government, the territories of the princely states were politically integrated into the Indian Union. The grouping of states at the time was done on the basis of political and historical considerations. In 1953, the first linguistic state of Andhra for Telugu-speaking people was born. The government was forced to separate the Telugu speaking areas from the state of Madras,

A commission under Fazal Ali to consider the new demands of reorganization of states on the Linguistic basis submitted the report and suggested that the whole country be divided into 16 states and three centrally administered areas. But the government divided the country into 14 states and 6 union territories under the States Reorganization Act passed in November 1956.

In 1960, the state of Bombay was bifurcated to create the states of Gujarat and Maharashtra following violence and agitation. In 1963, the state of Nagaland was created for the sake of the Nagas and total number of states stood at 16.

Based on the Shah Commission report in April 1966, the Punjab Reorganization Act was passed by the Parliament. Following this, the state of Haryana got the Punjabi-speaking areas while the hilly areas went to the Union Territory of Himachal Pradesh. Chandigarh, which was made a Union Territory, would serve as the common capital of Punjab and Haryana.

In 1969 and in 1971, the states of Meghalaya and Himachal Pradesh came into being respectively. With the Union Territories of Tripura and Manipur being converted into states, the total number of Indian states rose to 21.

Thereafter, Sikkim in 1975 and Mizoram, Arunachal Pradesh in February 1987 also acquired the status of states. In May 1987, Goa became the 25th state of the Indian Union, while three new states of Jharkhand, Chhattisgarh and Uttaranchal were formed in November

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2000. On June 2, 2014, Telangana officially became India's 29th state.

Presently, India has 29 states and 7 union territories. Due to unavailability of the data for many indicators, Telangana is not considered as separate state in this study.

**Objectives :-**

1) To analyze the Statistical data for measuring the level of socioeconomic development of the states of India in the years 2012-2013 and 2016-2017.
2) To rank the states on the basis of socio-economic development in the year 2012-2013 and 2016-2017.
3) To classify the states on the basis of level of socio-economic development in the year 2012-2013 and 2016-2017.
4) To compare the ranking and study the change in the level of development in different states between these two time periods

**RESEARCH METHODOLOGY**

Principal component analysis reduces the dimensionality of a set of data while trying to preserve the structure. Principal components can be used to reduce the number of variables in statistical analyses. The mathematical technique used in PCA is called eigen analysis: we solve for the eigen values and eigenvectors of a square symmetric matrix with sums of squares and cross products. The eigenvector associated with the largest eigenvalue has the same direction as the first principal component. The eigenvector associated with the second largest eigenvalue determines the direction of the second principal component. The sum of the eigenvalues equals the trace of the square matrix and the maximum number of eigenvectors equals the number of rows (or columns) of this matrix.

Consider a multivariate data matrix

$$V = [V_{ij}] \quad i = 1, 2, 3, \ldots\ldots\ldots n$$
$$j = 1, 2, 3, \ldots\ldots\ldots, k$$

Where Vi denote the cases and Vj denote the variables (or indicators)

Let the matrix V be normalized using formula

$$U_{ij} = \frac{V_{ij} - V_j}{\sigma_j}$$

Where $V_j$ is Mean of $V_{ij}$ and $_j$ is Standard deviation of $V_{ij}$

Let $Z = [z_{ij}]$ where $i = 1, 2, 3, \ldots\ldots\ldots k$

and $j = 1, 2, 3, \ldots\ldots\ldots k$ -------(ii)

be correlation matrix of U and it is a symmetric matrix of order k.

Consider equation

$$ZW = \lambda W$$

where $\lambda$ is called eigen value of Z and w is W called eigenvector or latent vector of Z.

$\lambda$ is the root of equation

$$|Z - \lambda I| = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots(ii)$$

Equation (ii) is an equation of degree k in terms of $\lambda$ and will have k roots Let $\lambda_1, \lambda_2, \lambda_3, \ldots\ldots \lambda_k$ be the roots of (i) and $w_1, w_2, \ldots\ldots, w_k$ be the corresponding eigenvectors.

Let $W = [w_{ij}]$

$$i = 1, 2, 3, \ldots\ldots\ldots\ldots k$$
$$j = 1, 2, 3, \ldots\ldots\ldots\ldots k \qquad \ldots (iii)$$

be the matrix of eigenvectors such that

$$\lambda_1 \geq \lambda_2 \geq \lambda_3 \ldots\ldots\ldots \geq \lambda_k$$

This matrix is also called the matrix of factor loadings.

Let $\lambda_1, \lambda_2, \lambda_3 \ldots\ldots\ldots, \lambda m$ be the values greater than or equals to 1.

Consider a matrix $M = [m_{ij}]$ $i = 1, 2, 3, \ldots\ldots k$

$j = 1, 2, 3, \ldots\ldots k$ be the matrix of first k eigen vectors.

Then principal Component Score $P_{ij}$ is calculated by the formula

$$P_{ij} = \frac{\sum m_{ij} \cdot U_j^T}{\sigma_j}$$ where $m_j$ = factor loading of first component on j the variable.

$U_j^T$ = normalized value of j the variable

$\sigma_j$ = S.D. of $j^{th}$ variable.(this value is 1 for normalized data)

$P_{ij}$ is called first principal component score.

Similarly $P_{2j}, P_{3j}, \ldots\ldots P_{mj}$ can be calculated as principal Component score for $2^{nd}, 3^{rd}, \ldots\ldots, m^{th}$ Principal Components .These principal Component scores (PC scores) are used as data for further analysis.

Since these scores carry negative signs, for further analysis to form Composite principal scores, a constant, which equals to the maximum magnitude of negative

number in the same data, is added in all the respective principal component score.

The composite principal component score (CS) is calculated by the formulas.

$$CS = \frac{\sum_{i=1}^{m} P_i \lambda_i}{\sum_{i=1}^{m} \lambda_i}$$

This value is finally divided by maximum of CS, to obtain the values between 0 & 1.

## RESULTS AND DISCUSSION

The study has been made to rank and classify the states of India on the basis of overall socio-economic development. Total 72 socio-economic Development Indicators are included in the study from the data published by government agencies for the years 2012-2013 and 2016-2017. The analysis is done on the basis of development indicators and the states are ranked on the basis of the Principal Component Scores obtained by the states. The states are further classified on the basis of the rankings as Developed, Developing and low developed states. The Socio-economic indicators given in Table1 are studied from the data published by government agencies for these years.

Spearman's Rank Correlation coefficient is calculated between the scores obtained by the states in these two time period.

## CONCLUSION

It is revealed from the study that, From table 2,

1. out of 29 states in India under this study, 3 states i.e. Delhi, Maharashtra and Tamil Nadu remain as developed state.
2. Uttar Pradesh Slipped to the Developing category and Karnataka and Kerala jumped to developed states category in the time period of these five years.
3. Arunachal Pradesh and Jammu & Kashmir remain low developed in both the time periods.
4. Himachal Pradesh, Manipur and Uttarakhand slipped from developing in 2012-2013 to low developed category in 2016-2017.
5. Assam, Jharkhand and Nagaland Jumped from Low developed category in 2012-2013 to Developing category in 2016-2017.
6. Remaining all states retain their position in the same category in these two time periods, though there is some variations in their rankings.
7. Most of the developed states in the recent year (2016-2017) are from south In.dia Except Maharashtra and Delhi which fall in Central and North Indian regions respectively
8. All of the Low developed states are from hilly area, in 2012-2013 as well as 2016-2017.
9. Spearman's Rank correlation Coefficient (0.85) is significant at 1% level and it shows that there is no significant variations in the ranking of the states between these two time periods.

**Table 1.Socio-economic Development Indicators**

| | |
|---|---|
| 1. Geographical area ( Lakh Sq. km.) | 35. Yield of all Cereals per hectare |
| 2. Population of the state in Lakh | 36. Per capita food grains Production (kg.) |
| 3. Density of population(per sq.km) | 37. Percentage of gross irrigated area to gross cropped area |
| 4. Percentage of urban population to total population | 38. Net area sown per cultivator (ha.) |
| 5. Percentage of State population to all India | 39. Percentage of net area sown to total geographical area |
| population | 40. Cropping intensity |

13. Percentage of agricultural workers to total workers
14. Female workers participation rate
15. Literacy Percentage (Male)
16. Literacy Percentage (Female)
17. Literacy Percentage (Total)
18. Birth rate
19. Death Rate
20. Infant Mortality Rate
21. Per capita revenue receipts of the State in Rs.
22. Share of State's own Tax Revenue in Total revenue receipts (per cent)
23. Per Capita Grants From Centre
24. Per capita share in central taxes
25. Share of development expenditure in total expenditure (per cent)
26. Number of banking offices per lakh population
27. Per capita deposits in Scheduled Commercial Banks
28. Per capita credit in Scheduled Commercial Banks
29. Credit –Deposit Ratio (Per cent) in Scheduled Commercial Banks
30. No. of Accounts ('000) in Pradhan Mantri Mudra Yojana
31. Amount Disbursed ( Crore) in Pradhan Mantri Mudra Yojana
32. Annual Credit Plan In crores
33. Annual Rain Fall
34. Average size of operational Holdings (ha.)
49. CAGR (Per cent)in establishment
50. CAGR (Per cent) in employment
51. Installed capacity of electricity per lakh population (MW)
52. Total annual per capita consumption of electricity (Kwh)
53. annual per capita domestic consumption of electricity (Kwh)
54. annual per capita industrial consumption of electricity (Kwh)
55. annual per capita agricultural consumption of electricity (Kwh)
56. Motor vehicles per lakh population (no.)
57. Total road length per hundred sq. km. of area (km)
58. Railway route length per hundred sq. km. of area (km)
59. Tele-density Wire line
60. Tele-density Wireless
61. State's share in total value of mineral production
62. Enrolment in primary and secondary schools per thousand population
63. Gross Enrolment Ratio
64. Pupil-Teacher Ratio Primary Level Classes I to IV
65. Pupil-Teacher Ratio Primary Level Classes V to VIII
66. Pupil-Teacher Ratio Primary Level Classes IX to X
67. Pupil-Teacher Ratio Primary Level Classes XI to XII
68. Average number of Teachers per school
69. Percentage of female Teachers
70. Per cent of children fully immunized
71. Crimes against women (no.)
72. Crimes against children (no.)

The following table shows the ranks and classification of the states into three different categories as developed, Developing and low developed states.

**Table 2.Classification of the States**

| 2012-2013 | | 2016-2017 | |
|---|---|---|---|
| **DEVELOPED STATES** | **SCORE** | **DEVELOPED STATES** | **SCORE** |
| 1. Delhi | 1.0000 | 1. Delhi | 1.0000 |
| 2. Maharashtra | 0.8520 | 2. Maharashtra | 0.9187 |
| 3. Tamil Nadu | 0.8501 | 3. Tamil Nadu | 0.8868 |
| 4. Uttar Pradesh | 0.7357 | 4. Karnataka | 0.7856 |
| | | 5. Kerala | 0.7639 |
| **DEVELOPING STATES** | **SCORE** | **DEVELOPING STATES** | **SCORE** |
| 5. Andhra Pradesh | 0.6793 | 6. Goa | 0.7526 |
| 6. Gujarat | 0.6694 | 7. Uttar Pradesh | 0.7342 |
| 7. Kerala | 0.6497 | 8. Andhra Pradesh | 0.7273 |
| 8. Goa | 0.6204 | 9. West Bengal | 0.6982 |
| 9. Punjab | 0.6060 | 10. Gujarat | 0.6909 |
| 10.West Bengal | 0.5897 | 11. Punjab | 0.6344 |
| 11. Karnataka | 0.5358 | 12. Haryana | 0.5649 |
| 12. Sikkim | 0.4682 | 13. Madhya Pradesh | 0.5447 |
| 13. Haryana | 0.4050 | 14. Bihar | 0.5229 |
| 14. Rajasthan | 0.3604 | 15. Rajasthan | 0.5170 |

| | | | |
|---|---|---|---|
| 15. Madhya Pradesh | 0.3498 | 16. Chhattisgarh | 0.4918 |
| 16. Himachal Pradesh | 0.3309 | 17. Sikkim | 0.4775 |
| 17. Manipur | 0.3165 | 18. Mizoram | 0.4675 |
| 18. Mizoram | 0.2769 | 19. Nagaland | 0.4202 |
| 19. Chhattisgarh | 0.2309 | 20. Odisha | 0.4051 |
| 20. Tripura | 0.1629 | 21. Assam | 0.3891 |
| 21. Meghalaya | 0.1498 | 22. Tripura | 0.3889 |
| 22. Bihar | 0.1304 | 23. Meghalaya | 0.3449 |
| 23. Uttarakhand | 0.1123 | 24. Jharkhand | 0.3350 |
| 24. Odisha | 0.1026 | | |
| **LOW DEVELOPED STATES** | **SCORE** | **LOW DEVELOPED STATES** | **SCORE** |
| 25. Assam | 0.0590 | 25. Uttarakhand | 0.332 |
| 26. Jharkhand | 0.0395 | 26. Himachal Pradesh | 0.3304 |
| 27. Arunachal Pradesh | 0.0265 | 27. Manipur | 0.3134 |
| 28. Jammu and Kashmir | 0.0222 | 28. Arunachal Pradesh | 0.2930 |
| 29. Nagaland | 0.0053 | 29. Jammu and Kashmir | 0.1574 |

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