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Status of National Rural Livelihood Mission in India: A comparative Study of Punjab and Rajasthan

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Abstract

National Rural Livelihood Mission is a poverty alleviation and employment generation programme. The main aim of this scheme is to promote the self-employment and organizing rural poor people living below poverty line (BPL). This scheme is reconstructed from SGSY in 2011 by Ministry of Rural Development (MoRD). The major idea of NRLM is to make self-help groups to generate self-employment opportunities in poor families of rural areas. Under this scheme, self-help groups (SHGs) at the village level are constituted in the form of federation and these self-help groups provide beneficial self-employment opportunities to the rural people for ensuring better as well as stable livelihood. This scheme mainly focuses on women, SC/ST, Minorities and Disabled people. The main objective of this research paper is to discuss the origin of NRLM in Punjab and Rajasthan and to discuss the physical and financial status of NRLM in both of these states. This study is based on secondary data. It is found that the coverage of National Rural Livelihood Mission is better in Rajasthan as compared to Punjab in terms of its coverage at block, village, and Gram Panchayats level. The mobilization of the total households and self-help groups is also higher in Rajasthan as compared to Punjab state.

1. Introduction

Government of India has been using three approaches to reduce the poverty: by achieving higher economic growth to improve standard of living, by implementing Anti-Poverty Programmes and by increasing public expenditure on social areas. Poverty alleviation programs are activated in both rural and urban areas. From a large section of Indian population living in rural areas, most of the people belonging to Scheduled castes, Scheduled tribes and many others lead a life of below poverty line (BPL families). So, for the betterment of rural poor people time to time many poverty alleviation programs like Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self-Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga Kalyan Yojana (GKY) and Million Wells Scheme (MWS) were launched. All these Schemes were merged into Swarnajayanti Gram Swarojgar Yojana (SGSY). Now, this scheme SGSY has been restructured and redesigned into National Rural Livelihood Mission NRLM by the Ministry of Rural Development (MoRD), Government of India in June 2011. This scheme is main focused on promoting

self-employment and organization of rural poor. The basic idea behind this programme is to organize the poor into SHG (Self Help Groups) groups and make them capable for self-employment.

2. Objectives of the Study

The main objectives of the paper are:

1. To discuss the coverage of NRLM scheme on the Block level, Gram Panchayats and Village level in Punjab and Rajasthan.
2. To describe the position with respect to the saving mobilization into NRLM self-help groups in Punjab and Rajasthan.
3. To explain the role of Punchsutras followed by NRLM self-help groups in Punjab and Rajasthan.
4. To compare the social category wise number of households mobilized in NRLM self-help group in Punjab and Rajasthan.
5. To examine the performance of social category wise number self-help groups in Punjab and Rajasthan.
6. To explain the disbursement of the revolving fund into NRLM self-help groups in Punjab and Rajasthan.

3. Research Methodology

This study is based on secondary data. The secondary data have been collected from various journals, Govt. reports, and websites etc, and for analysis percentage tool has been used.

4. Origin of National Rural Livelihood Mission

National Rural Livelihood Mission (NRLM) named also as "Aajeevika" converted from Swarnajayanti Gram Swarojgar Yojana (SGSY) in June 2011 under the flagship programme of the ministry of Rural Development with the budget of $5.1billion to attain some new objectives too. In addition to self-employment, the NRLM aims at enhancing their capabilities and facilitate access to other entitlements such as wage employment and food security, and benefits of Indira Awas Yojana (IAY), drinking water, land improvement, education, and health and risk mitigation through convergence and coordination mechanism.

National Rural Livelihood Mission aims at promoting the self-employment and organizing rural poor people living Below Poverty Line (BPL). The major idea of National Rural Livelihood Mission is to make the SHGs to generate self-employment in poor families in rural areas. NRLM has been set out with an agenda to cover 7 crore rural poor households, across 600 districts, 6000 blocks, 2.5 lakh villages in the country through self-managed SHGs and federated

3 ibrarian.net/navon/paper/INTER_SECTORAL_GROWTH_LINKAGES IN _INDIA:IMPLICATIONS FOR_ POLICY AND _LIBERALIZED REFORMS.

institutions and support them for livelihoods collectives in a period of 5-10 years. Under this mission, self-help groups (SHGs) at the village level are constituted in the form of federation and these self-help groups provide beneficial self-employment opportunities to the rural people for ensuring better and stable livelihood. This mission gives focus on women, scheduled castes/scheduled tribes, minorities, and disabled people with the purpose to include at least one woman member of the identified poor families in self-help group. National Rural Livelihood Mission will aim at universal social mobilization and bring all 7crore or 70 million rural below poverty line (BPL) families under the self-help groups network in a phased manner over a span of next 10 years.

5. A Comparison of Punjab State Rural Livelihood Mission (PSRLM) & Rajasthan State Rural Livelihood Mission (RSRLM)

As far as NRLM is concerned the state Government has initiated the process of implementation of NRLM in the state by establishing state Rural Livelihood Mission (SRLM) Society at the state level. As per the guidelines of NRLM, every state must prepare Initial Annual Action Plan and submit the same to Ministry of Rural Development, Govt of India to start the pilot project.

5.1 Punjab State Rural Livelihood Mission (PSRLM)

Punjab consists of 20 districts with total population of 2,77,04,236 persons as per census 2011 with 1,46,34,819 males and 1,30,69,417 females the sex ratio was 893 and child sex ratio as 846, the total literacy in Punjab, according to the census 2011 was 76.68 percent with 81.48 percent male and 71.34 females. The geographical area is 1.5 percent of Punjab.

Punjab State Rural Livelihood Mission has prepared Initial Annual Action Plan for 14 blocks in 5 districts of Punjab. Punjab State Rural Livelihood Mission has been covering the 5 districts Tarn Taran (Khadoor Sahib, Valtoha and Chohla Sahib), Gurdaspur (Dhariwal and Dera Baba Nanak), Patiala (Rajpura, Sanaur and Patran), Sangrur (Sunam, Sangrur and Lehragaga) and Ferozepur (Guru Har-Sahai) by providing access to self-employment opportunities. However, recently two another districts Muktsar and Bathinda have been included in the mission. The main target of this mission is to reduce poverty by enabling poor households to access gainful self-employment, skilled wage employment opportunities, resulting in appreciable improvements in their livelihoods on sustainable basis through building strong institution of the poor.

5.2 Rajasthan State Rural Livelihood Mission (RAJEEVIKA)

Rajasthan consists of 20 districts with total population of 68548437 persons as per census 2011 with 35550997 males and 32997440 females the sex ratio was 928 and child sex ratio as 888, the total literacy in Rajasthan, according to the census 2011 was 66.11 percent with 79.19 percent male and 52.12 females. The geographical area is 10.4 percent of Punjab.

6. Physical and Financial Status of National Rural Livelihood Mission in Punjab and Rajasthan during 2015-16

Table 1 : Coverage of Blocks under NRLM Scheme in India, Punjab and Rajasthan

	Previous Progress	Target During	Progress During	Cumulative Progress
Punjab	12	45	2	14
Percentage of Punjab	0.56	2.06	0.98	0.59
Rajasthan	2	74	33	35
Percentage of Haryana	0.09	3.39	16.18	1.48
India	2161	2182	204	2365

Source: Reports of NRLM (Official website)

In this table, the coverage of blocks under NRLM scheme in India, Punjab, and Rajasthan during 2015-16 has been discussed. In 2015-16, in India total 204 new Blocks were covered as against target 2182 under this Scheme. Rajasthan state covered 33 Blocks with 16.18 percent as against target 74 blocks but in Punjab, covered 2 new blocks with 0.98 percent during 2015-16. **Cumulative Progress means total of previous year progress up to 31ST March current year.** Cumulative progress with respect to coverage of total number of Blocks was such that it covered in Punjab 14 blocks with 0.59 percent and Rajasthan covered 35 blocks achieved higher progress in 2015-16. So, Rajasthan is faster as compared to Punjab in coverage of Blocks under this strategy during the period in 2015-16.

In this table, discusses the new Gram Panchayats which were covered under

Table 2 : Coverage of Gram Panchayats under NRLM Scheme in India, Punjab and Rajasthan

	Previous Progress	Target	Progress	Cumulative Progress
Punjab	219	100	258	447
Percentage of Punjab	219	2.90	1.97	0.86
Rajasthan	62	100	338	400
Percentage of Haryana	0.16	2.90	2.58	0.77
India	38860	3443	13125	52051

Source: Reports of NRLM (Official website)

NRLM scheme at India level and in Punjab and Rajasthan with respect to previous progress, progress of participation year and it also explains the cumulative progress in 2015-16. In 2015-16, Punjab covered the new 258 Gram Panchayats with 1.97 percent out of total 13125 Gram Panchayats in India and Rajasthan showed the higher level of 338 Gram Panchayats with 2.58 percent. It was found that Cumulative progress also increased during this period. The performance of Gram Panchayats also increased in both states, but the performance of Rajasthan was better than Punjab.

Table 3 : Coverage of Villages under NRLM Scheme in India, Punjab and Rajasthan

	Previous Progress	Target During 2015-2016	Progress During 2015-2016	Cumulative Progress 2015-2016
Punjab	219	100	257	476
Percentage of Punjab	0.22	1.55	1.08	0.39
Rajasthan	106	350	572	678
Percentage of Haryana	0.10	5.45	2.40	0.56
India	97177	6417	23789	120966

Source: Reports of NRLM (Official website)

In this table, the total number and percentage of villages which are covered under NRLM scheme in India, Punjab, and Rajasthan in 2015-16. Rajasthan has been covered 572 new villages (2.40 percent) of total new villages covered in India as compared to 257 new villages (1.08 percent) in Punjab. The performance of Rajasthan was much better than Punjab with respect to coverage of new villages.

Table 4 : Saving Mobilized into Self-help Group under NRLM Scheme in India, Punjab and Rajasthan

	Previous Progress	Target During	Progress During	Cumulative Progress
Punjab	186.93	300	198.97	385.30
Percentage of Punjab	0.02	1.11	0.41	0.05
Rajasthan	109.64	0.00	476.27	585.91
Percentage of Haryana	0.01	0.00	0.98	0.07
India	774776.00	27113.73	48712.05	823488.00

Source: Reports of NRLM (Official website)

In this table, we discuss the performance of the total amount and its percentage of saving which is mobilized by self-help groups under NRLM scheme in India, Punjab, and Rajasthan during 2015-16. The total amount Rs. 48712.05 lakh has been mobilized by self-help groups in India followed by Punjab 198.37 lakh with 0.41 percent and Rajasthan 476.27 lakh amount with 0.98 percent saving mobilized by self-help groups. While comparing Punjab and Rajasthan with respect to saving mobilized during 2015-16, it is found that the amount mobilized as saving was much less in Punjab as compared to Rajasthan.

Table 5 : Panchsutra followed by SHGs under NRLM Scheme in India, Punjab and Rajasthan

	Previous Progress	Target During	Progress During	Cumulative Progress
Punjab	871.00	800.00	1167.00	2038.00
Percentage of Punjab	0.07	1.64	0.94	0.15
Rajasthan	746.00	3280.00	2933.00	3679.00
Percentage of Haryana	0.06	6.71	2.37	0.27
India	1257916.00	48901.00	123635.00	1381551.00

Source: Reports of NRLM (Official website)

In this table, discusses about the total number and percentage of self-help groups which follows Panch Sutra under NRLM scheme at India level and in Punjab, and Rajasthan with respect to previous progress, progress of participation year and explains the cumulative progress 2015-16. In 2015-16 Punjab covered the new 1167 self-help groups which are following Panch Sutra with 0.94 percent out of total 123635 self-help groups in India and Rajasthan showed the higher number of self-help groups 2933 with 2.37 percent. Cumulative progress also increased. During this period, the performance of Panch Sutra increased in both states, but Rajasthan performed best as compared to Punjab during this period.

Secondly, manufacturing sector growth creates positive impulses for service sector growth. With the expansion of manufacturing activities demand the services like trade, transportation, storage, financing, banking, insurance and other infrastructure services increases. Thus, the growth of manufacturing sector through its linkages with service sector growth is further going to generate more employment opportunities.

Table 6 : Social category wise households mobilized into selp-help groups in India, Punjab and Rajasthan

	Previous Progress	Target During	Progress During	Cumulative Progress
SC Households				
Punjab	10996	4000	8526	19522
	0.247739	3.529453	2.099979	0.402968
Rajasthan	3919	0	19333	23252
	0.088295	0	4.761776	0.479962
India	4438545	113332	406004	4844549
ST Households				
Punjab	0	0	0	0
	0	0	0	0
Rajasthan	2386	0	7866	10252
	0.24473	0	6.774727	0.939636
India	974953	67937	116108	1091061
Minority Households				
Punjab	1350	1200	1348	2698
	0.072792	4.126122	1.008491	0.135696
Rajasthan	140	0	4218	4358
	0.007549	0	3.15565	0.219186
India	1854599	29083	133665	1988264
PWD Households				
Punjab	165	240	2	167
	0.064033	7.071302	0.011962	0.06086
Rajasthan	19	0	1121	1140
	0.007373	0	6.704946	0.415453
India	257680	3394	16719	274399
total				
Punjab	16869	8000	13773	30642
	0.090694	1.903692	0.911581	0.152366
Rajasthan	12074	0	49835	61909
	0.06	0.00	3.30	0.31
India	18599859	420236	1510891	20110750

Source: Reports of NRLM (Official website)

In this table, discusses the number and percentage of social category wise households which mobilized into self-help groups under NRLM scheme during the period of 2015-16 with respect to previous progress, the progress of participation year and it also explains the cumulative progress in terms of mobilization of households into self-help groups. During the period of 2015-16, total 8526 SC households were mobilized low position in Punjab as compared to 19333 SC households in Rajasthan. The mobilization of SC household increased in Rajasthan's position better to Punjab. ST Households: there is not any

mobilization of ST household in Punjab, but Rajasthan covered 7866 ST households in 2015-16. Minority Households: the total number of 1348 Minority household (1.00 percent) mobilized in Punjab and 4218 Minority households mobilized in Rajasthan in 2015-16. PWD Households: the mobilization of 2 PWD households is in Punjab performing as compared to low with 1121 PWD Households (6.70 percent) in 2015-16. So, the total number of households higher in Rajasthan as compared to Punjab.

Table 7 : Social category wise self-help groups under NRLM in India, Punjab and Rajasthan

	Previous Progress	Target During	Progress During	Cumulative Progress
SC SHGs				
Punjab	1000	0	815	1815
Percentage of Punjab	0.32		2.44	0.53
Rajasthan	336	0	1495	1831
Percentage of Haryana	0.10		4.48	0.54
India	305484	0	33360	338844
ST SHGs				
Punjab	0	0	0	0
Percentage of Punjab	0	0	0	0
Rajasthan	193	0	869	1062
Percentage of Haryana	0.29		7.74	1.38
India	65603	0	11223	76826
Minority SHGs				
Punjab	125	0	106	231
Percentage of Punjab	0.13		0.90	0.22
Rajasthan	9	0	297	306
Percentage of Haryana	0.01		2.53	0.30
India	89624	0	11693	101317
PWD SHGs				
Punjab	0	0	0	0
Percentage of Punjab	0	0	0	0
Rajasthan	0	0	0	0
Percentage of Haryana	0	0	0	0
India	26908	0	1553	28461
total SHGs				
Punjab	1449	800	1245	2694
Percentage of Punjab	0.09	1.43	0.93	0.15
Rajasthan	1003	3280	4202	5205
Percentage of Haryana	0.06	5.89	3.15	0.30

Source: Reports of NRLM (Official website)

In this table, we are discussing the social category wise total number and percentage of self-help groups which are mobilized under NRLM scheme in India, Punjab, and Rajasthan 2015-16. The total number 133392 self-help groups are mobilized in India. Punjab worked with 1245 self-help group with 0.93 percent and Rajasthan state mobilized 4202 self-help group with 3.15 percent in 2015-16. SC self-help groups: The total numbers of 33360 SC self-help groups are mobilized in India. Punjab mobilized with 2.44 percent and Rajasthan mobilized 1495 SC self- help groups with 4.48 percent in 2015-16. ST self-help groups: in India, covered 11223 ST self-help groups. Minority self-help groups: The total number of 111693 self-help groups mobilized in Indian level under NRLM Scheme. Punjab state mobilized 106 self-help groups with 0.90 percent and Rajasthan state mobilized 297 self-help groups with 2.53 percent during 2015-16. PWD self-help groups are not working in Punjab and Rajasthan during this period.

Table 8 : Disbursed of Revolving Fund into self help groups under NRLM

	Previous Progress		Target During		Progress During		Cumulative Progress	
	SHGs	Amount	SHGs	Amount	SHGs	Amount	SHGs	Amount
SC SHGs	sd							
Punjab	669	96.83919	445	66.65	629	94.35	1298	191.1892
Percentage of Punjab	2.08	2.10	4.98	5.19	3.43	3.53	2.57	2.63
Rajasthan	182	27.45	530	79.5	506	75.75	688	103.2
Percentage of Haryana	0.56	0.59	5.93	6.20	2.76	2.84	1.36	1.42
India	32043	4592.043	8927	1281.982	18304	2666.29	50347	7258.333
ST SHGs								
Punjab	0	0	0	0	0	0	0	0
Percentage of Punjab	0	0	0	0	0	0	0	0
Rajasthan	111	16.8	400	60	300	44.1	411	60.9
Percentage of Haryana	1.03	1.09	5.42	5.61	4.77	5.04	2.40	2.52
India	10773	1538.45	7375	1068.79	6287	874.325	17060	2412.8
Minority SHGs								
Punjab	92	13.53124	133	19.99	91	13.65	183	27.18124
Percentage of Punjab	0.68	0.68	4.80	5.54	1.26	1.27	0.88	0.89
Rajasthan	1	0.15	28	4.2	49	7.35	50	7.5
Percentage of Haryana	0.007	0.007	1.01	1.16	0.68	0.68	0.24	0.24
India	13463	1972.065	2769	360.2157	7203	1069.71	20666	3041.77
PWD SHGs								
Punjab	0	0	27	2	2	0.3	2	0.3
Percentage of Punjab	0	0	2.88	1.55	0.24	0.31	0.06	0.07
Rajasthan	0	0	13	1.95	0	0	0	0
Percentage of Haryana	0	0	1.39	1.51	0	0	0	0
India	2104	293.98	935	128.9	806	96.52	2910	390
total SHGs								
Punjab	989	143.8824	890	133.3	949	142.35	1938	286.23
Percentage of Punjab	0.84	0.83	2.41	2.52	1.28	1.32	1.01	1.02
Rajasthan	520	78.3	1348	202.2	1630	243	2150	321.3
Percentage of Haryana	0.44	0.45	3.65	3.82	2.21	2.26	1.12	1.15
India	117724	17154.04	36929	5280.45	73644	10731	191368	27885

Source: Reports of NRLM (Official website)

In this table, we are discussing the social category wise disbursal of Revolving Fund to self-help groups which are received amount under NRLM scheme in India, Punjab, and Rajasthan 2015-16. The total number 73644 self-help groups are received 10731 lakh Revolving Fund in India. Punjab received 142.35 lakh Revolving Fund for 949 self-help group with 1.28 percent and Rajasthan state received 243 lakh Revolving Fund for 1630 self-help group with 2.21 percent in 2015-16. SC self-help groups: The total numbers of 18304 SC self-help groups are received 2666.29 lakh Revolving Fund in India. Punjab received 94.35 lakh Revolving Fund for 629 SCself-help groups percent and Rajasthan received 75.75 lakh Revolving Fund for 506 SC self- help groups with 2.76 percent in 2015-16.

8. Conclusion

To conclude it can be said that National Rural Livelihood Mission performed better in Rajasthan as compared to Punjab. Rajasthan's best performance has been outstanding in terms of two coverage of blocks, Gram Panchayats, and villages under NRLM Scheme as compared to Punjab. It is also found that higher number of social category wise households and Self-Help Groups are mobilized under NRLM in Rajasthan. The amount of saving mobilized by self-help groups under NRLM in Rajasthan is higher as compared to Punjab.

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Carbon Credit Accounting- A Bird's Eye-view

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Abstract

Entire world is suffering and has survived from the changing climatic conditions and environmental conservations. The environment has been troubled due to blindly running towards the industrialization and development. Factors of reduction in carbon dioxide emissions, greenhouse gas emissions, the current scenario globally and the current status in India working on carbon credit accounting is also explained in detail. The need of carbon credit accounting has been discussed briefly concluding with the facts and figures in assumption of future with the analysis done presently and with the past records. Studying and referring the topics below will help giving you the information about the carbon credit accounting.

Keywords: Carbon Credit, Green House Gases, Kyoto Protocol, Financial Instrument

1. Introduction

Carbon credit accounting is the survival mantra for the next generation dealing with number of techniques, methods, and processes to stay in the race causing environmental and climate change issues. The notion of climate keeps on varying every second and every minute. One of the foremost reasons for this altercation is Global Warming, it is a phenomenon which raises the temperature of the earth. This leads to unusual seasonal changes, sandstorms, low pressure, depression, excessive heat pertaining illness and diseases around the globe. To live satisfied and happy with being protected, sheltered, from such emissions, it is our primary concern to nullify some part of emissions of carbon dioxide gases. The ongoing government should have stringent and hard policies, process, rules, regulations for carbon credit accounting to be a standard metric utilized by any commercial firm but rather not as a money alluring commodity. Carbon accounting is a social activity that keeps a track on the amount of carbon dioxide equivalents which will not be emitted into atmosphere because of altering the projects under Kyoto Protocol mechanism. Emission trading system is often called as cap and trade. The main motive of this principle is the pollution control and the fight against climate change globally.

2. Objectives

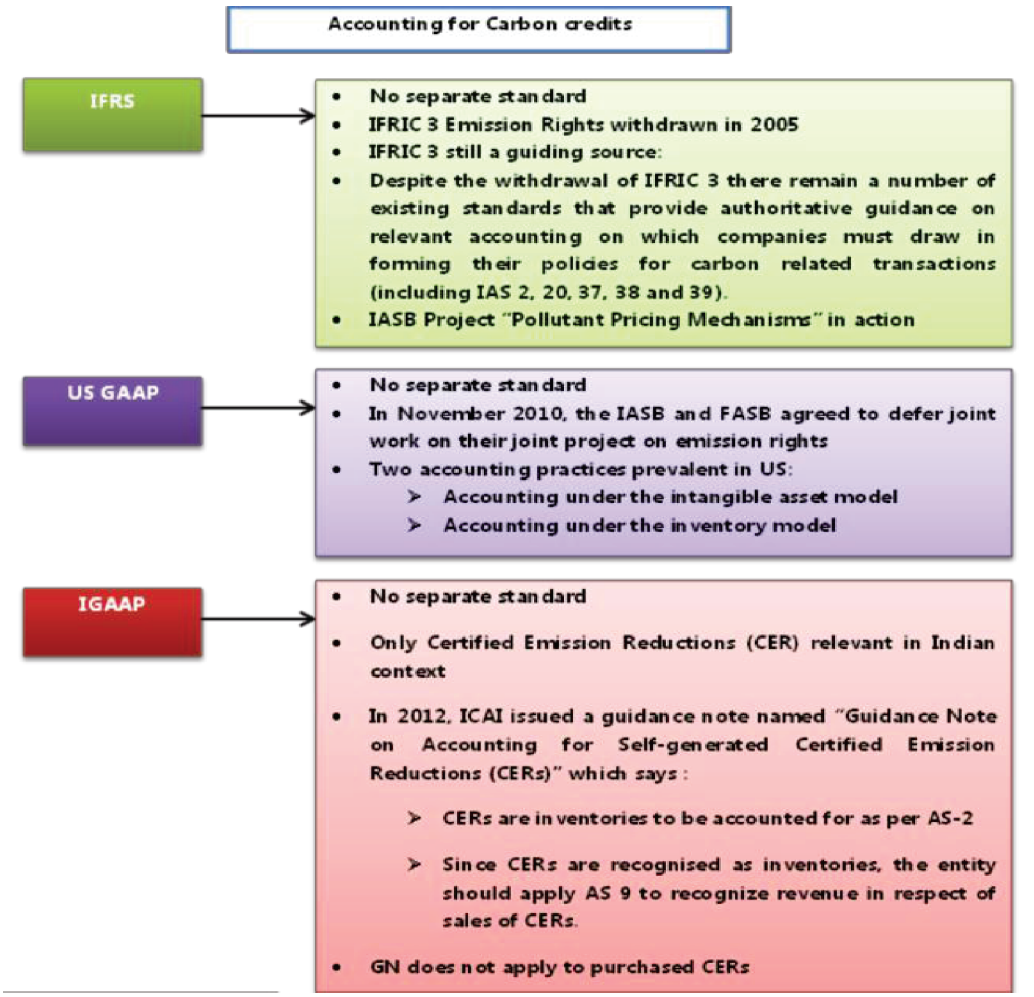
- To understand the concept of carbon credit accounting
- To study the trends in carbon emissions in selected countries from the year 2005 to 2017
- To study need of carbon credit accounting.

3. Research Methodology

The study is based on secondary data. The data required for the study is collected from the various business magazines, newspapers, articles and internet.

4. Limitations

This study is limited to the availability of secondary data



5. Introduction to the Study

As we can see from the above table, there is no specific authoritative literature for accounting of carbon credits. This has resulted in divergent schools of thought for accounting carbon credits. The US GAAP is the accounting standard that is used by the US registered company in security exchange commission (SEC) and IGAAP- Indian GAAP is for Indian companies.

The target for emission reduction varies between countries i.e., CO_2. Here, the comparison between six selected countries such as European Union, USA, Japan, China, Australia, UK has been done that shows the GHG emission reduction targets by change from 2005 in 2017. This includes the national and international commitments through the UNFCC.

Countries	Percent change from 2005-2017
UK	-61%
USA	-35% to -39%
EU	-34%
AUSTRALIA	-26 to-28%
JAPAN	-25%
CHINA	+72% to +96%

6. Present Status around the Globe

In the global context, carbon trading and accounting can sell the credits at the prevailing market price globally. Until the global slowdown in 2017, carbon was one of the most lucrative commodities, where the value was nearly twice between 2017 and 2018. According to World Bank report, India was analysed and been expected to earn around $100mln yearly and while trading in the carbon credits, Indian companies were expected to cover at least 10 per cent of the global market in the initial years.

The ICCA has set eight principles for reducing worldwide greenhouse emission together with India.

1. Develop a structure and design to accelerate greenhouse emission reduction and avoid market hinderances and minimize carbon emissions.
2. Target the most important, best, and lowest price abatement opportunities.
3. Push for energy potency is to enhance and to cut back the greenhouse emission. A recent study found that for each unit of greenhouse gases emits directly or indirectly by the industry, the trade allows over two units emission saving via product and technologies provided to alternative industries and customers.
4. Support the event and Implementation of latest technology.
5. Support the event of the foremost economical and property use of accessible feedstocks and energy.
6. Giving incentive for quicker action by satisfying 'early movers that proactively cut back their carbon emission.

7. Push for the foremost economical and property disposal, recovery, and usage choices.
8. Develop technology cooperation to support abatement in developing countries If trade policy manufacturers and alternative stakeholders take step to facilitate emission reduction and totally utilize chemical product, the study suggests the magnitude relation of emissions savings may increase to over 4 to 1 by 2030.

7. Need of Carbon Credit Accounting

The companies in the developed world are required to meet certain carbon emission target set by their respective government. Further, if these companies are unable to meet the target of emission, then they have an alternative of buying these carbon credits from the global market which means the market from somebody who is successful in achieving these targets and who has an access of carbon credits. This phenomenon is known as carbon trading. Carbon trading is also playing a very important tool for the companies of the developing world as it provides monetary gains in exchange of carbon credits which help companies to buy or change their technology. Such adaptation in technology finally helps in reducing the carbon emission for the companies. The basic need for carbon trading was realized when it was felt that the firms have been the immense and largest polluter of greenhouse gases which has created an outcome in global warming. Many efforts were made at large extent by the NGOs and other related institutions to bring the attention of the world towards the issue of global warming. But this issue was not considered a very seriously which results in nothing much. Hence it was felt that if we attach some financial incentives then only the attention of the world can be made towards this issue.

8. Conclusion

Measuring any activity is very important and that is why accounting standards for emissions of carbon are crucially important because accounting create an impact on reporting which is comparable and intense increase in the quality of information. The diverge in practice in the comparable of financial statements which comes into the output in a more suitable decision-making process. This results in to increasing social concern about climate changes in general and CO2emission. Despitethese advantages there is non-international standards that specify how the accounting for emission rights, and which leads companies to make decision as how to enter them if they decide to account for them. Generally, there are various ways for accounting for the carbon dioxide emission rights, according to the various interpretations from IFRS. For moment, few companies identified emission rights as non-tangible assets excluding inventory.

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Role of Corporate Governance to Combat Frauds: An Analysis of Indian Banking Sector

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Abstract

The economic development of any nation is determined by the strength of the financial system and the banking sector is one of the key constituents of it. Like any other economy, the Indian economy to a large extent is guided by the performance of its banking system. But the Indian banking sector suffers from its own set of challenges such as ethical practices, financial distress, and lack of good corporate governance. Efficient and effective corporate governance systems encourage the development of robust financial systems including the banking sector. The growing number of frauds and failure in the banking sector is the outcome of a lack of good governance. Accordingly, there is dire need to check the malpractices growing in the financial system in general and banking sector in particular. Taking into consideration the present study is an attempt to demonstrate the banking frauds considering corporate governance by proposing a conceptual framework for its analysis, adoption, and implementation. For this purpose, banking frauds from the year 2014 to 2018 are taken into consideration. The study is entirely based upon the use of secondary data collected from the bank's official website, Internet, and other published sources. The result of the study provides that even after stringent guidelines of the RBI there is an increasing number of frauds in the Indian banking sector including both private as well as public sector bank. Hence, the RBI should strengthen corporate governance to effectively check the incidence of financial frauds before its occurrence.

1. Introduction

The financial sector of India is the backbone of the Indian economy. It consists of financial institutions, financial intermediaries, financial products, and services. While the banking sector is one of the major constituents of the financial sector, it is suffering from various setbacks. In the past few years, instances of financial frauds in the banking sector have regularly increased and reported in India. Although to curb such frauds the guidelines related to corporate governance are continuously being implemented by the regulators, yet the frauds are increasing.

Security and Exchange Board of India (SEBI) defines corporate governance "as the acceptance by the management of the inalienable rights of shareholders as the true owners of the corporation and of their own role as trustees on behalf of the shareholders. It is about commitment to values, about ethical business conduct and about making a distinction between personal and corporate funds in the management of a company." [Khurana, S. (2010)]. Corporate governance reforms in India have involved a wide range of institutional and corporate initiatives. Indian organizations became aware of corporate governance around the year 1983

and the effective implementation started in the year 1997 with a voluntary code that was designed by Confederation of Indian Industries (CII). Indian organizations follow corporate governance guidelines followed by OECD. The objective of corporate governance in banks should first be protecting the interest of the depositors and then optimize the shareholder's interests. All other considerations will fall in place once these two objectives are achieved. RBI has given certain recommendations regarding the eligibility, academic qualification, and training of executive directors under the Ganguly committee. World bank has also given the report known as Report on the Observance of standards and codes (ROSC), which has an objective of effective corporate governance in various countries. Despite continuous efforts made by RBI and other organizations, there are still some loopholes which are a serious cause of concern. Due to which banking frauds in India are increasing at a fast pace. As per RBI, fraud can be "loosely" described as "any behaviour by which one person intends to gain a dishonest advantage over another." [Bhasin (2016)]. From 2013 to March 1, 2018, as many as 23,866 cases of fraud of Rs. One lakh or above in each case, were reported. A total of Rs. 1,00,718 crores were involved in all the cases together.

The table below shows the number and amount of banking frauds in India from 2014-2018.

Year	Frauds	
	Number	Amount(Rs.Crore)
2014-2015	4639	19445
2015-2016	4693	18698
2016-2017	5076	23933
2017-2018	5152	28459

Source : https://www.ndtv.com/india-news/reserve-bank-of-india-or-rbi-over-23-000-bank-fraud-cases-involving-Rs-1-lakh-crore-in-5-years-1846300

The impact of banking frauds had not only disrupted the working of the banking operations but also the economy. The reason behind such frauds is the lack of competent supervision by top management; lack of awareness of employees and customers; weakness of the regulatory system; conflict between the employees and third-party agencies; poor implementation of policies; and lack of proper tools and techniques for early detection of frauds. Thus, there is a need for strong governance standards and proper implementation of policies and programs in the banking sector to avoid such problems. The study seeks to fulfil two objectives, a) To understand and analyse the increasing trend in frauds committed in the Indian banking sector, and b) To enlighten the importance of corporate governance in the banking sector.

2. Review of Literature

Chilumuri (2013) studied corporate governance in the banking sector by taking the case of State Bank of India. The aim of the research paper was to evaluate the corporate governance practices in the banking sector in general and State Bank of India in particular. The study suggested that State Bank of India needs to ensure better corporate governance to achieve transparency, excellence, maximization of shareholders value and wealth. Singh et al. (2016) Examined the frauds in the Indian banking industry. This study attempted to cover issues such as banking frauds and mounting credit card debt, by using the secondary data. The credibility of third parties such as auditing firms and credit rating agencies was also questioned in the study and is believed to be a significant contributor amongst the other causes, such as inadequate diligence and oversight by banks. Deb (2013) analysed the corporate governance practices in Indian banks. The sample of study comprised of five banks operating in India. The results showed that banking has become complex and there is a need to give more importance to qualitative standards like internal controls and risk management, composition and role of the board and disclosure standards. Khanna and Arora (2009) examined the reasons for banking frauds and implementing preventive security controls in the Indian banking industry. This paper examined the issue of frauds from the perspective of the banking industry. The study evaluated the various causes that are responsible for banks frauds. The results indicated that lack of training, overburdened staff, competition, low compliance level are the main reasons for bank frauds. Asthana and Dutt (2013) analysed the Extent of Disclosure Code of Corporate Governance in India by conducting a Comparative Study of Public and Private Sector Banks. The study contributed novelty by measuring not only the disclosure practices which are mandatory and non-mandatory for the scheduled commercial banks listed at the stock market, but also the exemplary committees formed by banks both in public as well as private sector which are showing their inclination and intent for forming additional corporate governance committees other than the ones which are recommended by SEBI & Reserve Bank of India(RBI) to curb frauds. Kaveri (2014) studied the nature and extent of bank frauds, their modus of operandi, institutional arrangements for investigating and preventive strategies. For the purpose of study data relating to bank, frauds were collected. The policy guidelines of Reserve Bank of India wereexamined, and progress made in preventing frauds were studied. Bhasin (2016) examined the integration of technology to combat banking frauds. The aim of this study is to provide a discussion of the attitudes, strategies, and the technology that bank specialists will need to combat frauds. For this purpose, a questionnaire-based survey was conducted in 2013-14 among 345 bank employees to know their perception. Ponduri, Sailaja, and Begum (2014) analysed emerging economies fraud and fraud prevention through corporate governance. It was an exploratory study that focused on various corporate frauds, the genesis of the frauds, people responsible for various frauds and the role of regulatory bodies in overcoming those frauds.

3. Analysis and Interpretation

A closer yearly understanding of the losses incurred due to the financial fraud shows that in the year 2014 alone there were three major banking frauds. First, Kolkata-based industrialist Bipin Vohra and others were charged by the CBI for allegedly cheating Central Bank of India by obtaining the loan of Rs. 139 crores with forged documents and using the money for purposes other than that stated. Second, Officials of Ahmedabad-based Electrotherm India allegedly cheated Central Bank of India in connivance with bank employees. CBI booked the company directors in the case. It involved an amount of Rs. 437crores.Third, another scam that was unfolded in 2014 was the bribe-for-loan scam involving ex-chairman and MD of Syndicate Bank SK Jain for involvement in sanctioning Rs 8,000 crore.

Another fraud that raised eyebrows involved deputy general manager of Central Bank of India and three directors of Jain Infraprojects Ltd — MK Jain, Rekha Jain, and Sunil Kumar Dangi — for allegedly defrauding the bank for an amount of Rs.212crore in the year 2015.

In the same year, a money laundering scam was disclosed for Rs.6000 crore. Employees of various banks were involved including Oriental Bank of Commerce and Bank of Baroda was allegedly party to the scam.

One of the biggest banking frauds is the one involving Syndicate Bank, where almost 380 accounts were opened by four people including a chief manager, who defrauded the bank of Rs 1000 crore using fake cheques, LOU and LIC policies to withdraw money in the year 2016.

The promoters of Abhijeet Group – Manoj Jayaswal and Abhishek Jayaswal and former DGM of Canara Bank, TL Pai were arrested in the year 2017 for allegedly defrauding Canara and Vijaya Banks which involved an amount of Rs.290 crore. In the same year, CBI arrested Padmakar Deshpande, an officer of Bank of Maharashtra from Pune, along with the director of a private logistics company, Siddhi Vinayak Logistics from Surat, in connection with an alleged fraud of Rs 836-crore. One of the most publicized alleged frauds in India's banking history was by liquor baron Vijay Mallya who was accused of defrauding a pool of lenders rose to Rs.9000 crore.

A Kolkata business tycoon Nilesh Parekh was arrested for causing a loss of Rs. 2223 crore to the association of twenty-five banks led by the SBI. He was arrested twice by the CBI in 2017 and the Directorate of Revenue Intelligence (DRI) in 2018 for defrauding a group of banks and for alleged fraud in the diversion of 1,700 kg of primary gold, respectively.

The recent scam that grabbed the headlines in 2018 was of the sheer size of Rs. 11450 crore which was one of the biggest bank frauds in the Indian banking sector. It was done with the help of the retired employees of PNB who issued at least 150 Letter of Undertakings (LOU) and allowed Nirav Modi Group to

defraud the bank and many other banks who gave loans to him. In addition, Modi also defrauded seventeen other banks of Rs 3,000 crore. In this case, however, fake LOU were recycled by the diamond jewellery group and illegally issued to other banks for borrowing money. Another fraud case that came to light this year was concerning a former director of Andhra Bank, who was arrested by Enforcement Directorate, in connection to an alleged Rs 5000 crore bank fraud case, involving a Gujarat-based pharmaceutical firm.

The above explanation is concluded in a table below :

Year	Case	Banks involved	Person involved	Amount
2014	Obtaining the loan with forged documents and used that money for the purpose other than stated.	Central Bank of India	Bipin Vohra	Rs 139 crores
2014	Electotherm requested for credit to enable them to supply steel and iron to one M/s Kamal Alloys Limited in Tanzania. The directors of M/s Electrotherm were also the director of the latter company. The company did not submit any proof of delivery of the material and defaulted in the loans taken.	Central Bank of India	Directors of the Electotherm and unknown public servants.	Rs 437 crores
2014	Bribe for loan	Syndicate Bank	SK Jain (ex-chairman of Syndicate bank)	Rs 8000 crore
2015	Fraudulently availing of the credit limit and letter of credit facility from CBI.	Central Bank of India	DGM Rakesh Jaiswal and promoters Mk Jain, Rekha Jain, and Sunil Kumar Dangi	Rs 212crore
2015	It was money laundering scam in which the loopholes were exploited in remittance rules to bring back illegal money parked abroad disguised as export revenue	Oriental Bank of Commerce and Bank of Baroda	SK Garg and Jainish Dubey and few others	Rs 6000 crore
2016	Use of fake cheques, letters of credit and LIC policies to withdraw money.	Syndicate bank	Four people including chief manager of Syndicate bank.	Rs 1000 crore
2017	Thirteen companies of Abhijeet group took loans from over 20 banks and financial institutions which allegedly turned into NPA's.	Canara and Vijaya banks	Manoj Jayaswal, Abhishek Jayaswal and TL Pai	Rs 290 crore
2017	The loan to the drivers was sanctioned without their knowledge and by using forged documents.	Bank of Maharashtra	Padmakar Deshpande and director of Siddhi Vinayak Logistics Ltd.	Rs 836-crore
2017	Accused of defrauding a consortium of lenders	Twelve bank Consortium led by SBI	Vijay Mallya	Rs 9000 crore
2017	Allegedly defrauded banks by diverting loan money via shell companies in Hong Kong, Singapore, and the UAE.	State Bank of India	Nilesh Parekh	Rs 2223 crore
2018	It was done with the help of the retired employees of PNB who issued at least 150 Letter of Undertakings (LOU) and allowed Nirav Modi Group to defraud the bank and many other banks who gave loans to him.	Punjab National Bank	Nirav Modi, Mehul Choksi	Rs14000 crore
2018	Money laundering case by bribing the former director of Andhra Bank	Andhra Bank	Anup Prakash Garg	Rs5000 crore

Source: Authors' own compilation

The growing numbers of cases of frauds in the banks show that there is a lack of a proper corporate governance code in the Indian banking sector. It has been seen that most of the frauds are conducted because:

a) Of the negligence of management in providing proper training and education (fraud awareness) of employees due to which their involvement in bank frauds is increasing. These are not just lower/middle-level employees but also the CMDs and directors of different banks. For instance, in the year 2014, the ex-chairman and managing director (MD) of the Syndicate Bank was involved in a fraud case of Rs. 8000 crores.

b) sometimes the bankers exceed their discretionary powers and give loans without proper collateral security or with forged documents and after receiving the amount they escape which cause huge losses to the banks. In the year 2018 fake LOU was issued by the employees of PNB without proper collateral security.

c) of the inadequate checking of the core banking system in which day to day banking transactions is recorded.

d) Of an increasing number of the alternate channels for doing the banking transactions.

e) of not following the rules relating to board composition and regulations requiring independent and qualified audit committee as in the case of PNB where the one part-time director was supposed to play all the important roles in the audit committee.

4. Conclusion and Suggestions

From the above study, it can be concluded that various initiatives are taken by various committees and institutions to bring an environment of good corporate governance in the Indian banking sector. But the number of frauds is increasing year by year which is not only breaking the trust of the investors but also responsible for causing huge losses to the banks. The possible reasons are lack of customer as well as employee awareness, inadequate disclosure in the annual reports concerning the composition of board and audit committee, improper checking of core banking system where day to day transactions is recorded. To overcome such problems the following suggestions should be implemented:

- It is the duty of the Board to provide strategic guidance to the banks to ensure effective monitoring of the management and be accountable to the company and its shareholders. It should also ensure the integrity of the company's accounting and financial reporting systems.
- The proper checking of the core banking system where day to day bank transactions is recorded.

- Every bank should have a separate committee having specially trained officers which would ensure the bank's compliance towards corporate governance standards.
- In the pace of technological advancement, technology should be seen as a game changer which can reduce the chance of human connivance.
- The role of the third parties as such auditors, chartered accountants, and advocates should also be examined with a tough eye. There is a need to design a system where they are not able to get into fraudulent practices.
- The regulators should focus more on implementation rather than framing the rules and regulations. They should continuously check whether the rules and regulations are properly implemented or not.
- The banks should be free of political and bureaucratic hurdles for this purpose the idea of privatizing public sectors banks should be taken into consideration.

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Interstate Inequality in India with Special Reference To Gender Inequality

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Abstract

Liberalization and globalization have enormous potential in accelerating economic growth through integration with the global economy. But the impacts of globalization on poverty reduction and in reducing gender inequality have remained uneven in India. The association between globalization and poverty reduction hides substantial variations within countries in their experiences with international economic integration. Several decades of rising trade and capital flows with increased growth have also influenced increasing inequality in India, particularly in gender dimensions. Despite rapid economic growth, the explosion of micro credit programs and self-help groups, and laudable efforts to increase women's political participation, gender disparities have remained deep and persistent in India. The UN Gender Inequality Index has ranked India below several sub-Saharan African countries. Gender disparities are even more pronounced in economic and political participation in India.

Here we try to focus on whether the benefits of accelerated growth reach the poor by studying inter-state variations in income as well as gender inequality. The present paper shows that economic development alone is insufficient to ensure significant progress in important dimensions of women's empowerment, in particular, significant progress in decision-making ability in the face of pervasive stereotypes against women's ability. Inter-state study of the income and gender gap shows that income growth has not been transmitted into the overall development of women in India.

The Gini, Thail, and Atkinson indices are used to measure inter-state inequality and rural-urban inequality in income distribution. Interstate variations are also shown through state-level GII (gender inequality index) and gender-specific IHDI(inequality-adjusted Human Development Index) over some time. The study shows that the inter-state inequality in the gender dimension and also in the human development dimension increased in the post-reform period. In a bid to attract FDI to their states, many states have completely overlooked the rural sector and concentrated their development in urban areas. This has resulted in increased rural-urban inequality. The study covers all the major states in India over the period ranging from 2000-01 to 2014-15.

Keywords : Liberalization, Income Inequality, Inequality Index, Theil, Atkinson, GII, IHDI

1. Introduction

The study of the relationship between growth, poverty reduction, and the gender gap normally emphasizes two important findings. First, it argues that contrary to the proposition that growth exacerbates income inequality, economic growth does benefit the poor (growth is pro-poor). Second, openness to international trade benefits the poor as much as it does the non-poor. Though there have been many interesting debates about these findings and the empirical research on the question of whether growth reduces or worsens income inequality remains inconclusive. This paper tries to show how the impact of trade liberalization and openness to international trade in India falls on state-level income inequality and the gender dimension of such inequality over the last decade.

Since Independence, the Indian government has been concerned about how to strengthen national unity and promote economic growth with regional equality. Balanced regional development has been considered essential for national integration, political stability, and economic viability. Naturally, the issue of regional balance has been given sharp focus in all the Plans, and various policies have been adopted for achieving balanced regional development in the economy. But it has not taken any positive steps to reduce the gender gap in development policy.

Redressing regional imbalances has been one of the primary objectives of Indian planning. The concern for regional disparities in development has been expressed in the government's policies and programs. The Eleventh Five-Year Plan (2007–12) has chosen 'faster and more inclusive growth as its central objective. It recognized the need to make growth 'more inclusive in terms of the benefits of growth flowing to those sections of the population, which have been bypassed by the high rates of economic growth achieved in recent years, especially the women. It has also been perceived that the disparities among regions have been increasing steadily and the benefits of the rapid growth have not reached all parts of the country in an equitable manner, as well as at the same degree to both genders. Hence, for growth to be 'more inclusive' regionally, the benefits of economic growth must be shared equally by all the regions and all sections of the people of the country. In the present juncture of the economy's progress, it would be useful to investigate how far economic growth has been 'inclusive', and to what extent the benefits of growth have been shared by different regions and groups of the country.

2. Literature Review

Nearly two decades after the introduction of market-oriented economic reforms in India, the consequences of these reforms on inequality are being vigorously debated, with different empirical studies reaching different conclusions concerning the evolution of inequality after the reforms. For instance, Bhalla's (2003) study of inequality trends between 1983 and 1999 concludes that "the claim that inequality has worsened" over this time period is "somewhat erroneous," while Singh et al. (2003) finds evidence of modest increases of regional and within-state inequality. The bulk of the literature on economic growth, trade openness, and the issue of convergence is based on cross-country data. Among the few exceptions are the studies by Islam (1995), Savvides (1995), and McCoskey (2002). This research builds on the work of Savvides (1995), which is the only existing study that has focused on these issues using panel data from all over Africa. The present paper contributes at least two innovations. Evaluating the economic performance of 20 states during 1960/61–1989/90, Dholakia (1994) finds evidence of convergence of long-term economic growth rates for the states. He has identified 1980/81 as the year of a break in the trend of real income after which many of the lagging states started growing, while the richer ones began to stagnate. Cashin & Sahay (1996a, 1996b) find that the dispersion in real per capita income across 20 states has increased during 1961–91 (s -divergence). Analyzing the economic performance of Indian states during the post-reform vis-à-vis the pre-reform period, Ahluwalia (2000) concludes that not all the rich states got richer relative to the poor ones, and not all the poor states got poorer, though inter-state inequality in income, measured by Gini coefficient, increased.

Ghosh et al. (1998), and Marjit& Mitra (1996) find evidence of divergence in per capita income across Indian states during 1960/61– 1994/95. Ghosh & De (1998) argue that regional imbalance in physical infrastructure has beenresponsible for increasing income disparity across states. Nagaraj et al. (1998) finds some evidenceagainst absolute convergence, but strong evidence in favour of conditional convergence among 17states during 1960–94. They argue that physical, economic, and social infrastructures hadsignificant effects on growth trends across states. Rao et al. (1999) observes that per capita incomesacross 14 major states have diverged, and inter-state disparities have been accentuated during 1965/66–1994/95. More recently, Sachs et al. (2002) observe overall divergence in real per capita gross SDPacross 14 major states during 1980–98. Divergence is particularly notable within the poorer groupof states. Trivedi (2002) finds that absolute convergence of per capita income across Indian

stateshas not occurred during 1960–92.

The review of the existing literature reveals that the results reported by the researchers are far from uniform, and a consensus is yet to emerge on the issue of convergence of per capita income across Indian states. Moreover, the impact of the economic reforms initiated in the early- 1990s on the regional disparities of per capita income has not been investigated adequately, and very little work has been done for identifying the states that have been converging to or diverging from a common steady state path of income.

3. Methodology

In this study, we have considered all 28 states and 5 Union Territories over the period 2004-5 to 2012-13 to consider the income inequality among the states. The 5 small states among the seven north-eastern states are taken as a composite state to maintain parity with the other states. Here, in this paper, first of all, a relationship is built among trade openness, defined as total external trade as a proportion of DGP, FDI inflow, average import duty, and overall DGP growth for India as a whole of the said study period. This will help to understand the case that trade openness and liberalization have a positive impact on the overall growth of the country. Next, it is shown the state per-capita income and state DGP growth rate for the same period.

To analyze the issue of how inter-state inequality has been affected after implementing the process of globalization the Theil inequality Index and Atkinson Index are calculated from the state PCI data. The primary data source is the Economic Survey of different years, the RBI bulletin, and NSSO data of different relevant rounds. Next, we calculate the Inequality Adjusted Human Development (IHDI) and the Gender Inequality Index (GII) for the states of India over the years, and the values are compared among the states. In calculating IHDI and GII we applied the UNDP methodology of 2010.

4. The relationship between trade openness, DFI inflow, Average import duty, GDP, and Rate of GDP growth

Table 1 shows the relationship between GDP growth rate with FDI flow, Trade openness, and average import duty from 2003-4 to 2013-14.This indicates that in this final phase of liberalization real GDP growth was motivated by the steady relaxing of import duties along with growth in foreign trade and increased volume of FDI. The correlation table (Table 2)also expresses the same fact. High negative correlation between the percentage of average import duty, and a high positive correlation between the trade openness and FDI flow to India. Over the last decade,the globalization process has contributed a lot to the overall GDP growth of India.

Table 1: Trade Openness, DFI Inflow, Average Import Duty GDP, and Average Rate of GDP Growth of India

YEAR	GDP Growth (real) (%)	FDI INFLOW (Rs. Cr.)	AVERAGE IMPORT DUTY(%)	TRADE OPENNESS
2000-01	5.6	10733	32.8	0.0970586
2001-02	6	18654	32	0.1692828
2002-03	4.3	12871	32.1	0.1979253
2003-04	8.3	10064	28.9	0.2171883
2004-05	6.2	14653	26.3	0.2703111
2005-06	8.4	24584	22.5	0.315199
2006-07	9.2	56390	18	0.3753837
2007-08	9	98642	16.2	0.3924246
2008-09	7.4	142829	13.5	0.5015886
2009-10	7.4	123120	12.1	0.4611439
2010-11	7.1	97320	11.8	0.5341016
2011-12	6.8	165146	11.1	0.4362872
2012-13	6.5	121907	10.4	0.4664069
2013-14	5.1	147518	9.7	0.4695844
2014-15	6.9	186830	9.2	0.4390986
20015-16	7.2	215893	8.6	0.4468345

Table 2: Partial Correlation Coefficient among, FDI inflow, average Import Duty and Trade Openness of India : controlling for GDP at factor cost

	FDI INFLO	AVGIMDTY	OPNIND
FDI INFLOW	1	-0.6778	0.6553
	0	13	13
	P=.	P=.011	P=.118
AVG.IMPORT DUTY	-0.6778	1	-0.7594
	13	0	13
	P=.011	P=.	P=.003
OPENNESS INDEX	0.6553	-0.7594	1
	13	13	0
	P=.118	P=.003	P=.

Partial Correlation is done as the variables are interrelated and the problem of multi-collinearity may arise. The value of the coefficients isself-explanatory, and the process of Globalization has had an appositive impact on the overall GDP growth for India over the last decade. There was a steady growth in DGP increased over the year with a steady reduction of Average import duty. Trade openness had also increased over the years but with a slight fluctuation in recent years. At the same time, the FDI inflow also showed an increasing trend with little ups and downs in 2 or three years. The regression coefficient is calculated as 0.549 among the Average GDP Growth and the other three variables of globalization.

5. India's International Trade in comparison with World Trade

Figure 1: World Trade Pattern Over the Years

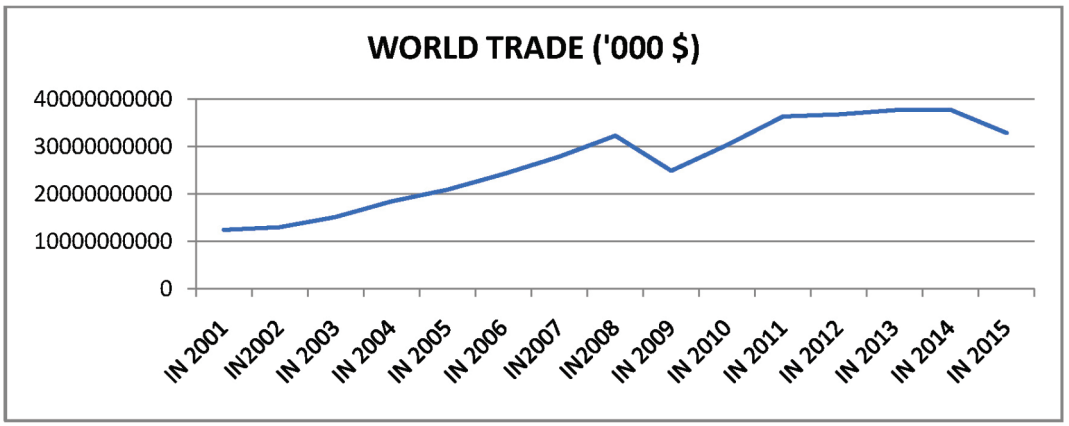


Figure 2: Indian Import as a Proportion of World Import

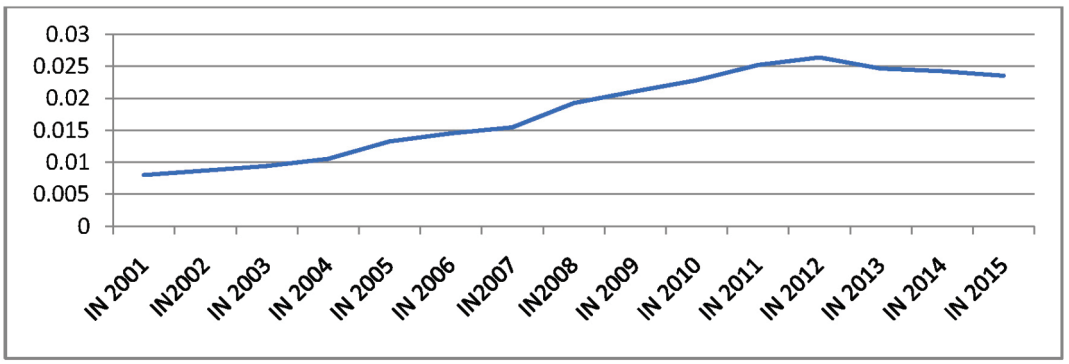
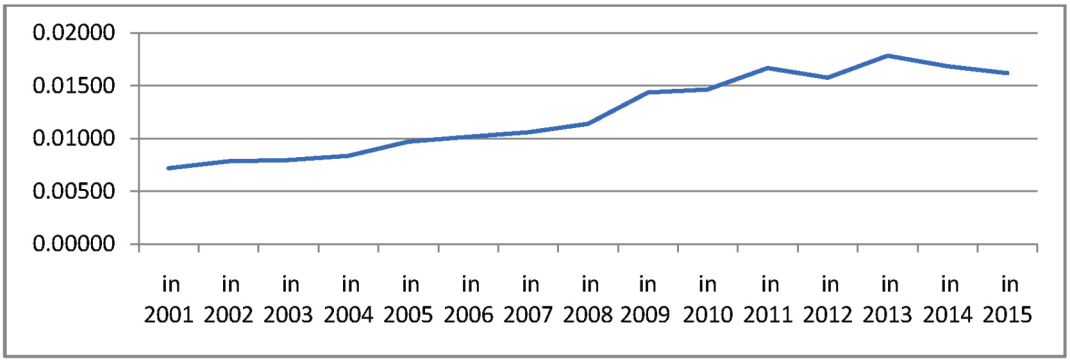


Figure 3: Indian Export as a Proportion of World Export



From the above three figures, we have a clear idea about the fact that India's external sector is following the Global trend and shows continuous growth of export and import between 2001 and 2015. The waves of globalization have covered the external sectors of India and its impact affected the overall development. Here an important question arises whether such development has been able to lower the differences in growth and inequalities among the states of India. So far it is clear that India is on the path of Globalization and liberalization in full swing. In the remaining parts of the paper, we will see the impact of globalization on the development process of the states of India.

6. The study Result for Inequality among the states

Let us consider the scenario for the states of India for the study period. State Per Capita income is taken as determining parameter on which the inequality indices are determined. Starting from well-known Gini Coefficient, the Theil Entropy Index (TE) and the Atkinson Index (A) of Inequality are derived.

Here the TE is derived based on the formula:

$TE(0) = -1/n \sum \ln(yi/\bar{y})$,

A positive and large α means TE will be more sensitive to what happens in the upper tail of the income distribution, and a positive and small α will make TE more sensitive to what happens in the bottom tail of the income distribution.
If $\alpha = 0$, then
$TE(0) = -1/n \sum \ln(yi/\bar{y})$,
This is the Mean Log deviation.
If $\alpha = 1$, then
$TE(1) = 1/n \sum (yi/\bar{y}). \ln(yi/\bar{y})$. =>Theil Index
The relative entropy is calculated based on the formula :
$RE(1) = TE(1)/MaxTE(1)$, where $MaxTE(\alpha) = (n\alpha - n)/ n(\alpha 2 - \alpha)$. For $\alpha > 1$
For $\alpha = 1$, $\approx \ln n$ (Most unequal distribution)
Thus $RE(1) = TE(1) / \ln n$

The Atkinson Index of inequality (A) is derived based on the formula:
$A(€)= 1 – (Yede/ Mean Y)$, Yede is the equally distributed equivalentincome.
$Yede= [1/n\sum yi\ 1-€\ ]1/1-€.$, € is the degree of inequality aversion. If € =0, Yede becomes the average income, and if €>0, Yede decreases and A(€) increases. Atkinson Index of inequality shows the percentage of total income that could be sacrificed to have equal distribution. As € increases, an increase in lower income is given more weight in producing social welfare.

6.1 The Gini coefficient of distribution of Consumption of India States:

Table 5 shows the Gini coefficient values for the rural and urban populations of the Indian states from 2004-05 to 2009-10. It is interesting to study the table which shows a general decrease in the Rural Gini coefficient values while there is an increase in the Gini values for the Urban population. This tells that the inequality among the urban population is rising while rural inequality is decreasing. A closer look at the Gini Index table tells that the change in the index for the rural population is greater than the change in the index for the urban population. As a greater proportion of the population lives in rural India, so it can be stated that after the full swing of Liberalization, the income inequality of a larger proportion of the people has decreased. Though to observe the actual degree of inequality it is needed to consider the Gini for different income groups for both the urban and rural sectors.

Table 3: The Gini coefficient of distribution of Consumption of India States

State	2004-05 (URP)*		2004-05 (MRP)*		2009-10 (URP)*		2009-10 (MRP)*	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
India	0.300	0.371	0.266	0.348	0.291	0.382	0.276	0.371
Andhra Pradesh	0.289	0.370	0.252	0.342	0.278	0.382	0.269	0.353
Arunachal Pradesh	0.270	0.244	0.240	0.213	0.333	0.325	0.293	0.299
Assam	0.195	0.316	0.182	0.301	0.244	0.324	0.220	0.328
Bihar	0.205	0.330	0.185	0.312	0.226	0.332	0.215	0.319
Chhattisgarh	0.295	0.434	0.251	0.354	0.276	0.326	0.234	0.305
Delhi	0.264	0.329	0.262	0.324	0.253	0.345	0.233	0.352
Goa	0.294	0.405	0.267	0.333	0.214	0.406	0.219	0.251
Gujarat	0.269	0.305	0.251	0.295	0.253	0.328	0.252	0.309
Haryana	0.322	0.360	0.295	0.326	0.301	0.360	0.278	0.357
Himachal Pradesh	0.296	0.318	0.260	0.261	0.305	0.399	0.283	0.351
Jammu & Kashmir	0.237	0.245	0.197	0.241	0.235	0.305	0.221	0.307
Jharkhand	0.225	0.351	0.199	0.326	0.240	0.358	0.212	0.343
Karnataka	0.263	0.364	0.232	0.358	0.235	0.334	0.231	0.375
Kerala	0.341	0.400	0.294	0.353	0.417	0.498	0.350	0.400
Madhya Pradesh	0.265	0.393	0.237	0.351	0.292	0.364	0.276	0.365
Maharashtra	0.308	0.372	0.270	0.350	0.268	0.410	0.244	0.380
Manipur	0.156	0.174	0.136	0.149	0.173	0.213	0.159	0.193
Meghalaya	0.157	0.258	0.136	0.240	0.200	0.256	0.170	0.243
Mizoram	0.193	0.244	0.167	0.213	0.237	0.230	0.194	0.228
Nagaland	0.207	0.235	0.173	0.214	0.186	0.237	0.181	0.222
Odisha	0.281	0.350	0.254	0.330	0.262	0.389	0.247	0.375
Punjab	0.279	0.393	0.263	0.323	0.288	0.371	0.285	0.358
Rajasthan	0.246	0.367	0.204	0.303	0.225	0.378	0.214	0.316
Sikkim	0.266	0.254	0.236	0.232	0.275	0.194	0.259	0.186
Tamil Nadu	0.316	0.356	0.258	0.345	0.264	0.332	0.257	0.327
Tripura	0.216	0.338	0.203	0.300	0.205	0.294	0.197	0.288
Uttar Pradesh	0.286	0.366	0.234	0.339	0.356	0.329	0.438	0.321
Uttarakhand	0.279	0.323	0.223	0.302	0.263	0.361	0.231	0.395
West Bengal	0.270	0.378	0.241	0.356	0.239	0.384	0.220	0.384
A&N Islands	0.290	0.351	0.253	0.305	0.246	0.271	0.256	0.316
Chandigarh	0.240	0.344	0.244	0.341	0.193	0.449	0.308	0.373
Dadra & N. Haevli	0.351	0.296	0.324	0.295	0.206	0.208	0.220	0.224
Daman & Diu	0.223	0.258	0.209	0.242	0.305	0.283	0.287	0.264
Lakshadweep	0.240	0.383	0.167	0.236	0.320	0.336	0.314	0.279
Puducherry	0.337	0.312	0.281	0.302	0.307	0.307	0.254	0.378

Source: Economic Survey GOI 2011-12

6.2 The Theil Index for the States of India:

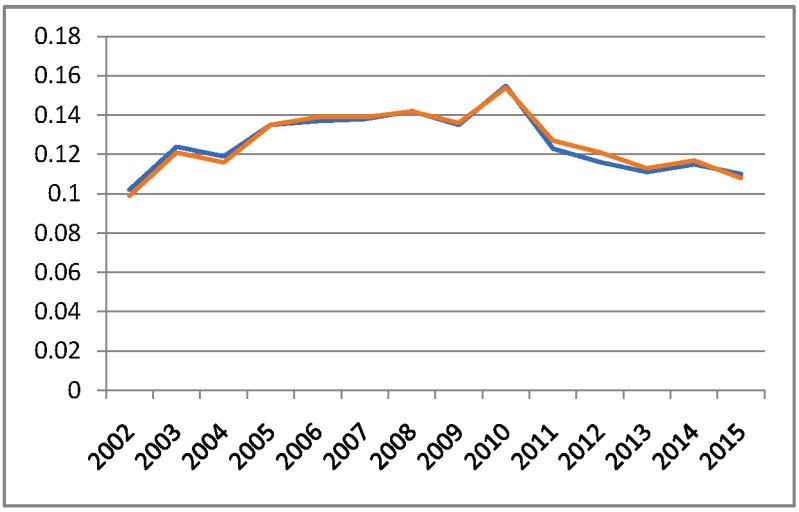
Inequality is a broader concept than poverty in that it is defined over the entire population, and not just for the population below a certain poverty line. Most inequality measures do not depend on the mean of the distribution, and this property of mean independence is considered to be a desirable property of an inequality measure.

Table 6 shows the Theil Index of inequality of the states of India over the last decade. The per capita income of the Indian states over the period is shown in appendix table 1A, on basis of which the Theil Index is calculated. This index is based on the concept of entropy which is a measure of disorder. In income distribution, it means a deviation from perfect equality. TE(0) is called the 'mean logarithmic deviation' and TE(1) is the Theil index. RE(1) is the Relative Entropy Index, defined as the ratio between the value of the original entropy index and the maximum value each member of that class assumes.

Table 4: The Theil Index for the States of India

YEAR	TE(1)	RE(1)	CHANGE IN TE
2002	0.102	0.099	
2003	0.124	0.121	0.022
2004	0.119	0.116	-0.005
005	0.135	0.135	0.019
2006	0.137	0.139	0.004
2007	0.138	0.139	0
2008	0.142	0.142	0.003
2009	0.135	0.136	-0.006
2010	0.155	0.154	0.018
2011	0.123	0.127	-0.027
2012	0.116	0.121	-0.006
2013	0.111	0.113	-0.008
2014	0.115	0.117	0.004
2015	0.11	0.108	-0.009

Figure 4: Theil Index of the States of India



If income is redistributed from relatively richer individuals to relatively poorer individuals, E(α) decreases, (here1). The opposite holds if income is redistributed from relatively poorer to relatively richer individuals. It is worth noting a particular characteristic of how these indexes satisfy the principle of transfers. For E (0), the change in the index depends on both the population size and the level of individual incomes involved in redistribution.In particular, the higher the gap between the income of the receiver and the income of the donor, the greater the reduction of E(0).

A closer look at the calculated Theil Index table tells that the overall inequality has decreased in the last decade as the value of Theil shows a decreasing trend. In the years between 2005 and 2009, the value of the Theil index wasincreasing, and it started decreasing after that. Thus, in the initial phase, the inequality increased and then started decreasing and also at a decreasing rate. This means that the redistribution has occurred in the lower-income groups with a closer level of income. i.e. the inequality among the poorer has decreased. This can be termed as the fruit of globalization which India has already started getting. The overall income distribution is moving towards a greater equitable distribution. In Fig. 4 this idea is depicted.

6.3 The Atkinson Index of Inequality for the States of India:

The distribution of social welfare based on income can be determined with the help of the Atkinson index. Table 7 shows the Atkinson index which is also calculated based on the Per-Capita income of the states over the study years as in table 1A. It is based on the concept of the Equally Distributed Equivalent (EDE) income, which is that level of income, if obtained by every individual in the income distribution, would enable the society to reach the same level of welfare as actual incomes. The value of the Atkinson index is that society is ready to give up that percentage of total income to have equally distributed incomes.

It is worth noting that by increasing ε, the value of the Atkinson Index also increases. It means that society is prepared to give up increasing shares of total income to achieve income equality.

Table 5: The Atkinson Index

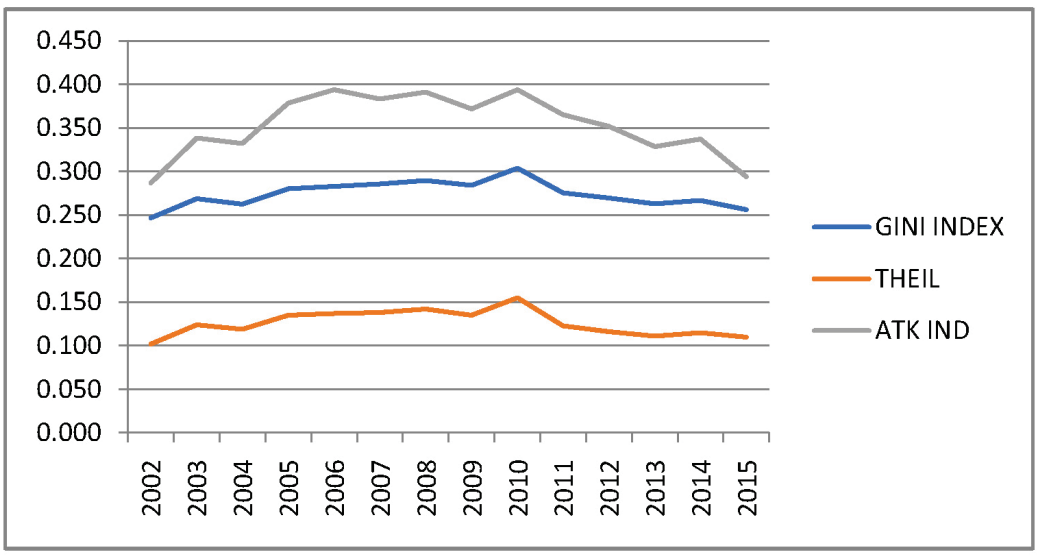
YEAR	ATK IND	GEN ENTROPY	CHANGE IN ATK
Y2002	0.286767	0.1609648	
Y2003	0.338476	0.2141859	0.053221
Y2004	0.332086	0.2069343	-0.00725
Y2005	0.378698	0.2650938	0.058159
Y2006	0.394035	0.2872268	0.022133
Y2007	0.383519	0.2718741	-0.01535
Y2008	0.3914	0.2833043	0.01143
Y2009	0.372084	0.2560458	-0.02726
Y2010	0.393947	0.2870946	0.031049
Y2011	0.365398	0.2471856	-0.03991
Y2012	0.351761	0.2299572	-0.01723
Y2013	0.328544	0.2030029	-0.02695
Y2014	0.337331	0.2128711	0.009868
Y2015	0.293871	0.2037032	-0.00917

The Atkinson index of the Indian states for the period 2002 to 2015 shows that there was a steady decline in inequality after 2010. In 2006 nearly 39 per cent of income had to be sacrificed to get equal incomes. This has come down to 32 per cent by the year 2013 and to 29 per cent in 2015. The result for change in the Atkinson index depicts the same story that from 2011 onwards the income distribution is moving towards an equitable one. The result for Generalized entropy (GE) shows that with €=2 (as it is taken for the present calculation) the equality goes in favour of the people of the lower strata of the income distribution which is no doubt a clear indication of the decline in income inequality in India. Thus, the entropy has been reduced on an overall basis for the states of India over the last decade and the percentage of reduction in inequality is nearly 8.6 per cent from 2006-7 to 2013-14. devote less expenditure on education as compared to the other states.

Table 6: Gini, Theil & Atkinson of the Indian States over the period 2001-02 and 2014-15

YEAR	GINI INDEX	THEIL	ATK IND
2002	0.247	0.102	0.287
2003	0.269	0.124	0.338
2004	0.262	0.119	0.332
2005	0.280	0.135	0.379
2006	0.283	0.137	0.394
2007	0.286	0.138	0.384
2008	0.290	0.142	0.391
2009	0.284	0.135	0.372
2010	0.304	0.155	0.394
2011	0.276	0.123	0.365
2012	0.270	0.116	0.352
2013	0.263	0.111	0.329
2014	0.267	0.115	0.337
2015	0.256	0.110	0.294

Figure 6: Movement of Gini, Theil, and Atkinson Index over the years for Indian States



6.4 Inequality Adjusted HDI (IHDI) &Gender Inequality Index (GII) and of Indian States:

The IHDI combines a country's average achievements in health, education, and income with how those achievements are distributed among the country's population by "discounting" each dimension's average value according to its level of inequality. Thus, the IHDI is the distribution-sensitive average level of HD. Two countries with different distributions of achievements can have the same average HDI value. Under perfect equality, the IHDI is equal to the HDI but falls below the HDI when inequality rises.

It considers the calculation in four dimensions: Per Capita (State) Income, expected length of life, Mean years of schooling, and Household Disposable income or Consumption Per Capita. All the dimensions are calculated for the major states of India for the year 2004-05 and the year 2014-15. The calculation is done based onthe UNDP methodology. In deriving the IHDI we applied the following formula:

The IHDI is the geometric mean of the three dimension indices adjusted for inequality:

$$IHDI^* = (I^*_{Health} \cdot I^*_{Education} \cdot I^*_{Income})^{1/3} = [(1-A_{Health}) \cdot (1-A_{Education}) \cdot (1-A_{Income})]^{1/3} \cdot HDI.$$

The loss in the Human Development Index due to inequality is:

$$Loss = 1 - [(1-A_{Health}) \cdot (1-A_{Education}) \cdot (1-A_{Income})]^{1/3}.$$

The HDI is the geometric mean of the three-dimensional indices:

$$HDI = (I_{Health} \cdot I_{Education} \cdot I_{Income})^{1/3}$$

Where, Dimension index = (actual value - minimum value) /(maximum value - minimum value)

The difference between the IHDI and HDI is the human development cost of inequality, also termed – the loss to human development due to inequality. The IHDI allows a direct link to inequalities in dimensions, it can inform policies towards inequality reduction and leads to a better understanding of inequalities across the population and their contribution to the overall human development cost. While the HDI can be viewed as an index of average achievements in human development dimensions, the IHDI measures the level of human development when the distribution of achievements across people in society is accounted for. The IHDI will be equal to the HDI when there is no inequality but falls below the HDI as inequality rises. The difference between the HDI and IHDI expressed as a percentage of the HDI indicates the loss in human development due to inequality.

Table 7: IHDI and Loss Due to Inequality of the states of India

STATES	IHDI 2004-05	HDI 2004-05	LOSS DUE TO INEQUALITY IN 2004-05	IHDI 2014-15	HDI 2014-15	LOSS DUE TO INEQUALITY IN 2014-15
Andhra Pradesh	0.40	0.68	40.28	0.41	0.75	45.40
Assam	0.39	0.62	37.03	0.40	0.69	42.22
Bihar	0.39	0.60	35.46	0.40	0.66	39.66
Chhattisgarh	0.39	0.59	33.50	0.41	0.69	40.02
Gujarat	0.39	0.64	39.57	0.40	0.74	45.23
Haryana	0.40	0.65	38.14	0.42	0.72	41.10
Himachal Pradesh	0.40	0.65	39.14	0.42	0.69	39.07
Jharkhand	0.37	0.59	36.54	0.40	0.67	40.50
Karnataka	0.40	0.67	40.10	0.39	0.75	47.74
Kerala	0.38	0.74	48.54	0.36	0.80	54.78
Madhya Pradesh	0.33	0.59	42.87	0.41	0.67	38.92
Maharashtra	0.42	0.66	36.64	0.41	0.74	43.95
Odisha	0.37	0.60	38.98	0.41	0.67	38.74
Punjab	0.43	0.68	37.14	0.40	0.74	44.99
Rajasthan	0.37	0.62	40.41	0.41	0.70	40.81
Tamil Nadu	0.39	0.68	43.34	0.40	0.76	47.75
Uttar Pradesh	0.36	0.58	37.76	0.40	0.66	38.55
Uttarakhand	0.40	0.61	34.58	0.43	0.70	39.11
West Bengal	0.38	0.66	41.73	0.39	0.74	48.02

The IHDI is the distribution-sensitive average level of HD. Two countries with different distributions of achievements can have the same average HDI value. Under perfect equality, the IHDI is equal to the HDI but falls below the HDI when inequality rises. The difference between the IHDI and HDI is the human development cost of inequality.

The result shows that loss of Human development has increased for almost all the states (except Orisha, Himachal Pradesh, and Rajasthan) from 2004-05 to 2014-15. Thus, the gains from increased per-capita income have not been transmitted to reduce overall human development. Income inequality has reduced but the inequality in human development has increased among the states.

6.5. The Gender Inequality Index On the states of India

Next, we consider the Gender Inequality Index (GII) of the states over the years. Gender inequality remains a major barrier to human development in India over the years. GII measures gender inequalities in three important aspects of human development—reproductive health, measured by maternal mortality ratio and

adolescent birth rates; empowerment, measured by the proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education; and economic status, expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older. The GII is built on the same framework as the IHDI — to better expose differences in the distribution of achievements between women and men. It measures the human development costs of gender inequality, thus the higher the GII value the more disparities between females and males and the more loss to human development.

The dimensions of GII are:

- The **health** dimension is measured by two indicators: the maternal mortality ratio and the adolescent fertility rate
- The **empowerment** dimension is also measured by two indicators: the share of parliamentary seats held by each sex and by secondary and higher education attainment levels
- The **labour** dimension is measured by women's participation in the workforce.

The GII is calculated based on the following formula:

For women and girls, the aggregation formula is

$$G_F = \sqrt[3]{\left[\left(\frac{10}{MMR}\right).\left(\frac{1}{TFR}\right)\right]^{\wedge\frac{1}{2}} (PR.SE)^1/2.LFPR}$$

$$G_M = \sqrt[3]{1.(\sqrt{(PR.SE)}.LFPR}$$

$$HARM_{GM,GF} = [1/2(1/ G_F + 1/ G_M)]^{-1/2}$$

$$G_{F,M} = \sqrt[3]{Health.Empowerment.LFPR}$$

Where , Health = [(10/MMR .1/TFR)+1]/2

Empowerment= $[(PR.SE)^{1/2} + [(1-PE).(1-SE)]^{1/2}]/2$

LFPR = ($LFPR_F$ +$LFPR_M$)/2

Now, GII = [1- ($HARM_{GM,GF}$ / $G_{F,M}$)]

Countries with unequal distribution of human development also experience high inequality between women and men, and countries with high gender inequality experience unequal distribution of human development. The GII reflects how women are disadvantaged in these dimensions. The GII is interpreted as a percentage and indicates the percentage of potential human development lost due to gender inequality.

The GII of the states of India is calculated for 2010-11 and 2014-15.It shows that the GII value has increased for most of the states, with the only exception of Chandigarh. Tamil Nadu, Kerala, and West Bengal. In the case of West Bengal, the index value has reduced due to the increased participation of women members in Parliament in the last Lok Sava election. Almost in all cases, the Education and Labour force participation rate the value of the indicator reduced between 2004-05 and 2014-15 which made the value of the index greater between these two time periods. The higher the values of GII, the worse will be the achievement. This indicates that there is a potential loss of human development due to gender inequality is evident in all the states of India have increased over the years. Thus, the same conclusion arises as the IHDI, that the increased income has not been able to reduce the gender disparity among the states.

Table 8: GII of the states of India between 2010-11 and 2015-16.

STATES ANF UTs	GII 2010-11	GII -2015-16
Andaman and Nicobar Islands	0.617	0.649
Andhra Pradesh	0.204	0.266
Arunachal Pradesh	0.676	0.680
Assam	0.392	0.435
Bihar	0.533	0.592
Chandigarh	0.747	0.389
Chhattisgarh	0.249	0.284
Dadra and Nagar Haveli	0.453	0.584
Daman and Diu	0.472	0.612
Delhi	0.259	0.359
Goa	0.221	0.675
Gujarat	0.270	0.345
Haryana	0.269	0.741
Himachal Pradesh	0.271	0.469
Jammu and Kashmir	0.644	0.706

Jharkhand	0.644	0.674
Karnataka	0.298	0.371
Kerala	0.646	0.268
Lakshadweep	0.302	0.643
Madhya Pradesh	0.244	0.379
Maharashtra	0.335	0.659
Manipur	0.746	0.742
Meghalaya	0.192	0.662
Mizoram	0.674	0.687
Nagaland	0.666	0.658
Odisha	0.682	0.370
Puducherry	0.655	0.728
Punjab	0.230	0.324
Rajasthan	0.363	0.427
Sikkim	0.671	0.653
Tamil Nadu	0.331	0.246
Tripura	0.653	0.678
Uttar Pradesh	0.357	0.407
Uttarakhand	0.280	0.311
West Bengal	0.322	0.271

7. Limitations of the study

The study period can be extended to 20-30 years back to compare the situation for the pre and post-globalization era. The study can be done more rigorously by extending it to the district-level income or other social sector data and also for different income groups. While considering the state-wise variations of economic growth performances it can be compared over the years to observe the change in the growth pattern which may help conclude the result derived from the inequality estimation. Other developmental issues like Multidimensional Poverty and deprivation Indices are to be compared to get a complete idea of inequality in India. The availability of adequate and authentic state-wise data in different dimensions of development is one of the prime limitations of this study.

8. Conclusion

This paper tries to show the impact of the adoption of liberalization and

globalization on the common people of the nation. It is clear that on an overall basis the implementation of the open economy policy had a serious impact on the distribution of income in the country as a whole. It took some painful years to bounce back the distribution in favorof the poorer section of the society. Initially globalization huts many, but this is converted into a gift to them after a few years. Globalization helps the nation to grow up with a human face. Again, the concept that globalization hurts the poor in its all forms, is also not true always. Conversely, the Theil and the Atkinson index shows the income distribution goes more equitable in the lower strata than the upper-income group in the case of India over the study periods. There are wide variations in the economic growth performances among the states. The imbalance is also seen in sector–wise performances for a specific state. To get a clearer picture of development we need to consider the various human development indicators along with the economic growth indicators. Human development is closely related to economic growth. Despite these variations and imbalances in economic performance, the overall inequality of income has been reduced over the last decade. When we categorically consider the inequality-adjusted Human Development and the Gender Inequality Index separately for each state it is seen that the loss of human development due to inequality is strikingly high irrespective of the states. This is a serious issue of debate in the future.

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जनजातियों के शैक्षणिक विकास में आश्रम छात्रावासों की भूमिका : राजस्थान की सहरिया जनजाति के विशेष संदर्भ में

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2 प्राचार्य, राजकीय कन्या कला महाविद्यालय, कोटा, राजस्थान।

3 प्राचार्य, राजकीय महाविद्यालय, खीवंसर, नागौर, राजस्थान।

4 सहायक आचार्य, अर्थशास्त्र, राजकीय महाविद्यालय, गुढ़ा, झुंझुनू, राजस्थान।

सारांश

राजस्थान की सहरिया जनजाति एक आदिम जनजाति है जो अपनी खराब आर्थिक स्थिति तथा निवास स्थानों की दूर–दराज की अवस्थिति के चलते आज भी शैक्षणिक विकास की दृष्टि से अत्याधिक पिछड़ी हुईहै। यह राज्य के केवल बाराँ जिले की दो तहसीलों–किशनगंज तथा शाहाबाद में बसी हुई है। अनुसूचित जनजाति के विद्यार्थियों के मध्य साक्षरता को बढ़ावा देने के उद्देश्य से जनजातीय कार्यमंत्रालय ने वर्ष 2008 से देश के सभी जनजातीय क्षेत्रों में आश्रम छात्रावासों की सीापना करना प्रारंभ किया जिससे कि इन आदिवासी समुदायों की निर्धनता तथा गरीबी कभी भी उनके बच्चों की शिक्षा मेंकोई बाधा न बन सकें। प्रस्तुत शोध–पत्र का मुख्य उद्देश्य जनजातियों के शैक्षणिक विकास में इन आश्रम छात्रावासों की भूमिका की जाँच सहरिया जनजाति के संदर्भमेंकरनाहै। प्रस्तुत शोध–पत्र प्राथमिक तथा द्वितीयक समंकों पर आधारित है।जिसमेंप्रतिदर्श का आकार 200 सहरिया परिवारहै। प्रत्येक तहसील से 100 सहरिया परिवारों का चयन यादृछिक प्रतिचयन की रीति के माध्यम से करके प्रश्नावली तथा साक्षात्कार अनुसूची के माध्यम से प्राथमिक समंकों का संकलन किया गया है। प्रस्तुत अध्ययन का निहितार्थ यह है कि शैक्षणिक विकास की दृष्टि से सहरिया जनजाति के बालक–बालिकाओं के लिए संचालित आश्रम छात्रावासों की यह योजना किशनगंज तथा शाहाबाद तहसीलों में कितनी कारगर साबित हुई है? साथ ही उक्त अध्ययन से यह स्पष्ट होता है कि आश्रम छात्रावासों के संचालन से किशनगंज की अपेक्षा शाहाबाद क्षेत्र के सहरिया परिवार अधिक लाभान्वित हुए हैं। प्रस्तुत अध्ययन से यह निष्कर्षनिकलता है कि किशनगंज क्षेत्र में उक्त योजना के समुचित क्रियान्वयन हेतु और अधिक प्रयास करने की आवश्यकता है जिससे कि यह योजना किशनगंज क्षेत्र के सहरिया जनजाति के विद्यार्थियों की शैक्षणिक उन्नति में मील का पत्थर साबित हो सके।

शब्दावली :–सहरिया, जनजातीय साक्षरता, आश्रम छात्रावास, शैक्षणिक विकास।

1. प्रस्तावना

भारत की भौगोलिक विशालता तथा विविधता के परिणामस्वरूप यहाँ पर बसने वाली सभी जातियों, जनजातियों तथा धर्मों से सम्बंधित लोगों के जीवन से संबंधित विभिन्न परिदृश्यों जैसे कि–जलवायु, खान–पान, रहन–सहन, भाषा, समाज, संस्कृति, धर्म, अर्थव्यवस्था तथा आदतों आदि में पर्याप्त विभिन्नताएँ विद्यमान हैं। यहाँ करीब सात सौ से अधिक आदिवासी समुदायों को संविधान के अनुच्छेद 342 के अंतर्गत 'अनुसूचित जनजाति' के रूप में अधिसूचित किया

गया है। जिनमें से 75 समुदाय आदिम ढंग की विशेषताओं वाले हैं जिन्हें जनजातीय कार्यमंत्रालय ने विशेष रूप से कमजोर जनजातीय समूहों (PVTGs) की श्रेणी में शामिल किया है। ये जनजातीय समूह भारत में पंजाब, हरियाणा, चंडीगढ़, पांडिचेरी, तथा दिल्ली के अतिरिक्त अन्य सभी राज्यों तथा संघ शासित प्रदेशों में विस्तृत है। भारत की जनजातीय आबादी वर्ष 2011 की जनगणना में 23.66 प्रतिशत की दशकीय वृद्धि दर से बढ़ती हुई 10,42,81,034 के स्तर पर जा पहुँची है, जोदेश की कुल जनसंख्या का 8.6 प्रतिशत है। भारत में इन जनजातियों की बसावट की सघनता एक समान नहीं है, जहाँ लक्षद्वीप तथा मिजोरम दोनों सघन जनजातीय बसावट वाले क्षेत्र है। इनकी कुल जनसंख्या में जनजातियों का भाग क्रमशः 94.80ः तथा 94.43ः है। इस प्रकार भारत में जनजातियों का वितरण असमान है। देश की दो–तिहाई से अधिक जनजातीय आबादी मध्यप्रदेश (14.69ः), महाराष्ट्र (10.08ः), ओड़िसा (9.20ः), राजस्थान (8.66ः), गुजरात (8.55ः), झारखण्ड (8.29ः) तथाछतीसगढ़ (7.50ः) आदि राज्यों में निवास करती है।

भारत की अधिकांशः जनजातीय आबादी मानव विकास के विभिन्न संकेतकों की दृष्टि से अन्य सभी सभ्य समुदायों से अपेक्षाकृत अत्याधिक पिछड़ी हुई है। भारत सदैव से ही समावेशी विकास की वकालत करता रहा है और समावेशी विकास को सुनिश्चित करने के उद्देश्य से सरकार ने संविधान में पिछड़े वर्गों को शिक्षा औरनौकरियों में आरक्षण देकर उन्हें सशक्त बनाने के कई उपाय किये हैं, परन्तु फिर भी ये पिछड़े वर्ग विशेषकर आदिवासी समुदाय अपनी शिक्षा और कौशल की कमी के चलते सदैव ही विकास की आड़ में रहे और कभी भी वे समावेशी विकास का हिस्सा नहीं बन पाए है। समावेशी विकास के लक्ष्य को हासिल करने में शिक्षा एक महत्वपूर्ण घटक है जो इन पिछड़े वर्गों में बेहतर समझ तथा जागरूकता को विकसित कर उन्हें अधिक से अधिक सक्षम बनाने का कार्य कर सकती है।

2. भारत में आश्रम छात्रावासों के निर्माण की योजना

भारत में जनजातियों के शैक्षणिक विकास के लिए कईकार्यक्रमतथा योजनाएँ संचालित की गई परन्तु ये जनजातियाँ सदैव ही अपनी विशिष्ट संस्कृति, भौगोलिक पृथक्करण तथा पिछड़ेपन के चलते इन कार्यक्रमों तथा योजनाओं से आशानुरूप लाभ प्राप्त करने में असफल रही है। अपने शर्मीलेपन तथा भोलेपन के स्वभाव के चलते इनमें से अधिकांश जनजातियाँ अपने बच्चों को बाहर जाकर माध्यमिक स्तर से आगे की पढ़ाई को निरंतर जारी रखने में या तो संकोच महसूसकरती है या फिर उनका निम्न आर्थिक स्तर उन्हें ऐसा करने नहीं देता है। जनजातियों की इस समस्या का उचित समाधान खोजने के उद्देश्य से सरकार ने वर्ष 2008 मेंदेश के सभी जनजातीय क्षेत्रों में आश्रम छात्रावासों के संचालन की योजना बनाकर उस`लागू करने का निर्णय लिया है। इस योजना में माध्यमिक, सीनियर, महाविद्यालय तथाविश्वविद्यालय स्तर की शिक्षा के लिए नवीन छात्रावासों के निर्माण तथा पुराने छात्रावासों के विस्तार का प्रावधान शामिल है। जहाँ इनके निर्माण के लिए भूमि प्रदान करने की जिम्मेदारी राज्य सरकार की होती है वहीं इनके निर्माण की लागत केंद्र तथा राज्यों के मध्य विभाजन के आधार पर वितरित की जाती है परन्तु फिर भी यह एक केंद्र प्रवर्तित योजना है। संपूर्ण देश में अनुसूचित जनजाति की छात्राओं के छात्रावासों तथा संघ राज्य क्षेत्रों और नक्सल प्रभावित इलाकों में छात्रा वर्ग के साथ–साथ छात्रों के लिए नवीन छात्रावासों के निर्माण की शत–प्रतिशत राशि केंद्र सरकार

द्वारा वहन की जाती है जबकि शेष सभी जनजातीय क्षेत्रों में छात्रों के लिए छात्रावासों के निर्माण की लागत को केंद्र तथा राज्य द्वारा 50:50 के अनुपात में वहन किया जाता है। केन्द्रीय विश्वविद्यालयों में अनुसूचित जनजाति के छात्र औरछात्रा वर्गों के लिए छात्रावासों के निर्माण की लागत की राशि को केंद्र तथा स्वयं विश्वविद्यालय द्वारा 90:10 के अनुपात में वहन किया जाता है। जबकि राज्य के विश्विद्यालयों के संदर्भ में इनकी निर्माण की कुललागत केंद्र, राज्य तथा विश्वविद्यालय द्वारा क्रमशः 45:45:10 के अनुपात में वहन की जाती है। यदि राज्य सरकार अपने हिस्से की राशि वहन करने में सक्षम न हा तो उसके हिस्से की राशि विश्वविद्यालय द्वारा स्वयं वहन करनी पड़ती है।

3. राजस्थान में आश्रम छात्रावासों की स्थिति

जनजातीय बसावट की दृष्टि से राजस्थान का देश में चौथा सीन है। 2011 की जनगणना के अनुसार सम्पूर्ण प्रदेश में कुल 92.38 लाख जनजातीय आबादी निवास करती है जिनमें बारह अलग–अलग प्रकार की जनजातियाँ शामिलहै। इन सब जनजातियों के सामाजिक तथा आर्थिक विकास के लिए राज्य सरकार ने जनजाति क्षेत्रीय विकास विभाग, उदयपुर की देख रेख मेंकई योजनाएँ संचालित कर रखीहै। जनजाति कल्याण निधि (महाराष्ट्र पैटर्न) के अंतर्गत आश्रम छात्रावासों के संचालन की योजना राज्य के अनुसूचित, माडा, बिखरी आबादी तथा सहरिया आदिम जाति के क्षेत्रों में चलाई जा रही है।

सारणी– 1 राजस्थान में आश्रम छात्रावासों की प्रगति

वर्ष	2010 –11	2011 –12	2012 –13	2013 –14	2014 –15	2015 –16	2016 –17	2017 18	2018 –19	2019 –20
बालक	167	168	168	173	168	170	171	172	172	175
बालिका	80	88	94	107	121	149	17 0	184	195	197

स्त्रोतः–वार्षिक प्रगति प्रतिवेदन (2010–11 से 2019–20 तक), जनजाति क्षेत्रीय विकास विभाग, उदयपुर

यह स्पष्ट होता है कि राजस्थान में वर्ष 2010–11 से 2019–20 की अवधि के दौरान आश्रम छात्रावासों के निर्माण की दरमें 50.61 प्रतिशत की वृद्धि दर्ज की गई है जिसमें छात्रा वर्ग के लिएयह वृद्धि दर 146.25 प्रतिशतर ही है जो कि छात्र वर्ग की दर्ज वृद्धि दर 4.8 प्रतिशत से कई गुणा अधिक है। यही नहीं पिछले एक दशक के दौरान इन आश्रम छात्रावासों की प्रवेश क्षमता 16,285 विद्यार्थियों से बढ़कर 25,190 विद्यार्थी हो गई है। इस प्रकार आश्रम छात्रावासों की प्रवेश क्षमता हुई वृद्धि को सारणी– 2 की सहायता से समझाया जा सकता है जिससे स्पष्ट होता है कि प्रवेश क्षमता में 54.68 प्रतिशत की वृध्दि दर्ज की गईहै। इसी अवधि में इन छात्रावासों में प्रवेश लेने वाले विद्यार्थियों की संख्या 55.56 प्रतिशत की दर बढ़ती हुई

सारणी– 2 वर्ष वार में आश्रम छात्रावासों की क्षमता तथा प्रवेशित विद्यार्थी

वर्ष	2010 –11	2011 –12	2012 –13	2013 –14	2014 –15	2015 –16	2016 –17	2017 –18	2018 –19	2019 –20
क्षमता	16285	16785	17085	18135	18585	21200	23045	24370	24805	25190
प्रवेशित	15273	16378	15558	16807	17434	19470	21871	22992	23962	23759

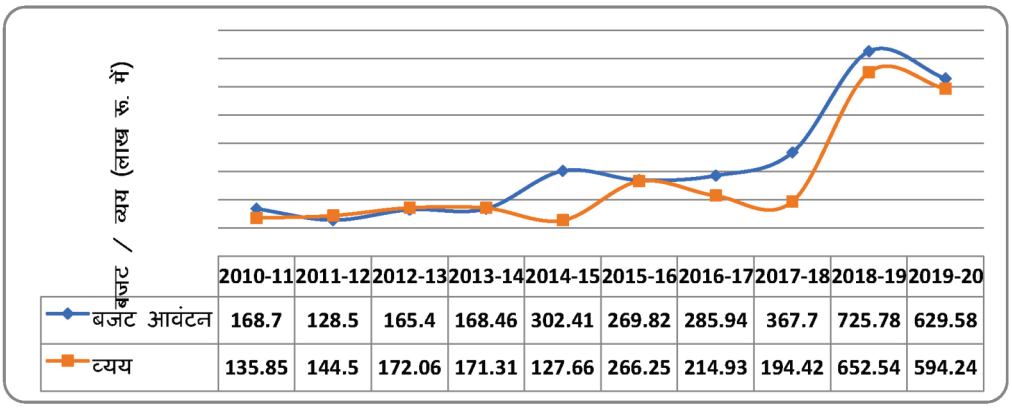
स्त्रोतः–वार्षिक प्रगति प्रतिवेदन (2010–11 से 2019–20 तक), जनजाति क्षेत्रीय विकास विभाग, उदयपुर

15273 से बढ़कर 23759 के स्तर पर जा पहुँची है। इन दोनों मदों में छात्रा वर्ग का प्रदर्शन अपेक्षाकृत छात्र वर्ग से कईगुणा अधिक बेहतर रहा है।जो यह सिद्ध करता है कि राज्य में पिछले एक दशक के दौरान अनुसूचित जनजाति की बालिकाओं की शिक्षा पर अपेक्षाकृत अधिक ध्यान आकर्षित करते हुए सरकार ने छात्रा वर्ग के लिए आश्रम छात्रावासों में अनुकूल माहौल तैयार करने का प्रयास किया है। जोकि एक सराहनीय कार्यहै।

4. सहरिया आदिम जाति के क्षेत्रों में आश्रम छात्रावासों की स्थिति

सहरिया विकास कार्यक्रम के अन्तर्गत वर्तमान में कुल 29 सहरिया आश्रम छात्रावासों का संचालन किया जा रहा है, जिसमें से 22 छात्र तथा 07 छात्रा वर्ग के लिए चलाए जा रहे है।

रेखाचित्र– 1 : सहरिया क्षेत्रों में आश्रम छात्रावासों की वित्तीय प्रगति



	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
बजट आवंटन	168.7	128.5	165.4	168.46	302.41	269.82	285.94	367.7	725.78	629.58
व्यय	135.85	144.5	172.06	171.31	127.66	266.25	214.93	194.42	652.54	594.24

पिछले एक दशक के दौरान सहरिया क्षेत्रों के अन्तर्गत संचालित छात्रावासों की वित्तीय प्रगति को रेखाचित्र– 1 तथा उसके संगत सारणी के माध्यम से स्पष्ट किया जा सकता है। इन छात्रावासों में अध्ययनरत विद्यार्थियों को सभी प्रकार सुविधाएँ उपलब्ध करवाई जा रही है, जिसमें–भोजन, आवास, वस्त्र के साथ–साथ कक्षा VI से XII तक के विद्यार्थियों में कठिन विषयों की समझ विकसित करने के उद्देश्य से अतिरिक्त कक्षाओं का आयोजन शामिलहै। पिछले एक दशक के दौरान सहरिया क्षेत्रों में संचालित आश्रम छात्रावासों की प्रवेश क्षमता तथा उन पर सहरिया जनजाति के विद्यार्थियों के प्रवेश की प्रवृत्ति को सारणी– 3 में दर्शाया गया है। जिससे यह स्पष्ट होता है कि सहरिया आदिम जाति के क्षेत्रों में संचालित आश्रम छात्रावासों की प्रवेश क्षमता तथा वास्तव में प्रवेश लेने वाले विद्यार्थियों की संख्या में 2010–11 से 2019–20 की अवधि के दौरान क्रमशः 28.76 तथा 35.95 प्रतिशत की वृद्धि दर्ज की गई है। सहरिया विकास कार्यक्रम तहत् इन छात्रावासों के

सारणी– 3 सहरिया क्षेत्रों के आश्रम छात्रावासों में प्रवेश की प्रवृत्ति

वर्ष	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20
क्षमता	1130	1230	1230	1230	1280	1355	1405	1455	1455	1455
प्रवेशित	1057	1219	1210	1213	1198	1347	1397	1444	1444	1437

स्त्रोतःवार्षिक प्रगति प्रतिवेदन (2010–11 से 2019–20 तक), जनजाति क्षेत्रीय विकास विभाग, उदयपुर

संस्थापन व्यय की राशि का प्रावधान जनजाति कल्याण निधि (महारष्ट्र प्रणाली) के अन्तर्गत नानॅ प्लान बजट में किया गया है। मौजूदा छात्रावास विस्तार और छात्रावासों के भवनों के निर्माण की लागत को केन्द्र एवं राज्यों के मध्य समान अनुपात में वहन किया जाता है।

5. अध्ययन का उद्देश्य

प्रस्तुत अध्ययन राजस्थान की सहरिया जनजाति के शैक्षणिक विकास में आश्रम छात्रावासों की भूमिका की जाँच करता है। अतः प्रस्तुत शोध–पत्र का उद्देश्य सहरिया जनजाति के शैक्षणिक विकास के लिए संचालित आश्रम छात्रावासों की योजना का बाँरा जिले की सहरिया बाहुल्य तहसीलों किशनगंज तथा शाहाबाद के संदर्भ में निम्न तुलनात्मक अध्ययन करना है–

1. योजना के बारे में सहरिया लोगों की जानकारी का अध्ययन करना।
2. योजना से लाभान्वित होने वाले सहरिया परिवारों का अध्ययन करना।
3. योजना से प्राप्त संतुष्टि का तुलनात्मक करना है।

6. साहित्य सिंहावलोकन

भारतमेंजनजातीय समुदायों के शैक्षणिक विकास के लिए संचालित आश्रम विद्यालयों तथा छात्रावासों की योजनाओं की प्रभावशीलता का विश्लेषण तथा आनुभविक अध्ययन समय–समय पर कई शोधार्थियों तथा संस्थानों द्वाराआयोजित किये गए है जैसे कि–**जनजातीय शोध एवं प्रशिक्षण संस्थान, पुणे (1994)** की रिपोर्ट से निष्कर्ष निकालता है कि आदिवासी छात्राओं के लिए निर्मित सरकारी छात्रावासों में आदिवासी छात्राओं की आवश्यकता के अनुसार सुधार करके अधिभोग की दर तथा सुविधाओं के उपयोग से सम्बन्धित विभिन्न मानकों में विकास किया जाना आवश्यक है। **बिपिनजोजो (2013)** ने अपने अध्ययन में विभिन्न चरों के आधार पर आश्रम विद्यालयों के माध्यम से अनुसूचित जनजाति के बच्चों दी जाने वाली शिक्षा की गुणवत्ता की जाँच मध्य और पूर्वी भारत के तीन राज्यों–छतीसगढ़, झारखण्ड तथा ओड़िसा में करने का प्रयास कियाहै। **सत्य सावित्री तथा होनाकेरी (2018)** का शोध–पत्र भारतमें 1961 से 2011 की अवधि के दौरान हुए शैक्षणिक विकास तथा अनुसूचित जनजातियों और अन्य समाजों के मध्य साक्षरता दर में पाए जाने वाले अन्तरालों का द्वितीयक समंकों के आधार पर विश्लेषण करता है। साथ ही में यह अध्ययन जनजातियों के शैक्षणिक विकास के लिए संचालित विभिन्न योजनाओं में से आश्रम विद्यालयों के संचालन पर विशेष ध्यान आकर्षित करता है। **संजय कुमार प्रधान (2011)** ने अपने शोध प्त्र में स्पष्ट किया है कि, सरकार द्वारा आदिवासी समुदायों के शैक्षणिक विकास के लिए किये गये अनेक प्रयासों के बावजूद आज भी आदिवासी शैक्षणिक विकास की दृष्टि से गैर–आदिवासियों से कहीं अधिक पीछे हैं। ऐसी परिस्थितियों में सरकार और नीति–निर्माताओं को जनजातीय क्षेत्रों में आश्रम विद्यालयों की पहल पर प्राथमिक स्तर से स्थानीय बोलियों में शिक्षण कार्य शुरू करने तथा उनकी शैक्षिक स्थिति में सुधार के लिए स्थानीय स्तर पर छात्रावासों की सीापना जैसे सर्वश्रेष्ठ प्रयास करने चाहिए।

7. शोध–प्रविधि

प्रस्तुत शोध पत्र राजस्थान की एकमात्र विशेष रूप से कमजोर जनजाति–सहरिया पर आधारित है। जिसमें सहरिया जनजाति के छात्र–छात्राओं के शैक्षणिक उत्थान लिए संचालित

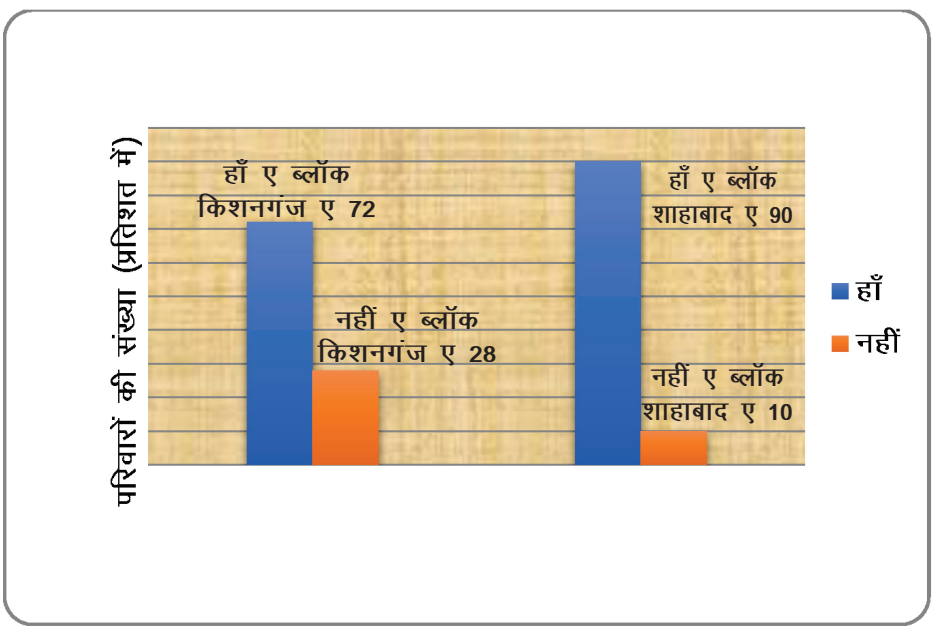
आश्रम छात्रावासों की योजना का राजस्थान की सहरिया बाहुल्य तहसीलों–किशनगंज तथा शाहाबाद के संदर्भ में तुलनात्मक अध्ययन किया गया है। प्रत्येक तहसील से 100 तथा कुल 200 सहरिया परिवारों का दैव प्रति चयन रीति के माध्यम से चयन किया गया है। दोनों तहसीलों से स्तरित प्रतिचयन विधि के द्वारा पाँच–पाँच गाँवों का चयन कर, प्रत्येक गाँव में से बीस–बीस अर्थात् कुल 200 सहरिया परिवारों का प्रतिदर्श लेकर साक्षात्कार अनुसूची तथा गूगल फॉर्म के माध्यम से ऑनलाइन प्रश्नावली भरवा कर प्राथमिक समंकों का संकलन किया गया है। साक्षात्कार अनुसूची अथवा प्रश्नावली में प्रश्नों का निर्माण–क्रम वाचक (Ordinal), मापक्रम (Scale) तथा संज्ञात्मक (Nominal) पैमाने के आधार पर किया गया है। यथोचित मात्रा में एकत्रित समंकों की अशुद्धियों तथा अनियमितताओं को ठीक करते हुए उन्हें सजातीयता तथा समानता के आधार पर अलग–अलग समूहों तथा वर्गों में वर्गीकृत करके, सारणीयन तथा रेखाचित्रों की सहायता से दर्शाया गया है। समंकों के विश्लेषण S.P.S.S. सॉफ्टवेयर के माध्यम से प्रतिशत विधि के द्वारा किया गया है।

8. विश्लेषण

राजस्थान में सहरिया आदिम समुदाय के बालक–बालिकाओं के शैक्षणिक विकास के लिए संचालित आश्रम छात्रावासों की योजना का संचालन जनजाति क्षेत्रीय विकास विभाग, उदयपुर, राजस्थान सरकार के निर्देशन में सहरिया परियोजना अधिकारी, शाहाबाद द्वारा किया जा रहा है। सहरिया क्षेत्रों में संचालित आश्रम छात्रावास योजना के संचालन के बारे में सहरिया लोगों की जानकारी, लाभ तथा संतुष्टि के सन्दर्भ में चयनित प्रतिदर्श से पूछताछ करने पर निम्न परिणाम प्राप्त हुए हैं।

9. योजनाओं के बारे में जानकारी

रेखाचित्र 2 : आश्रम छात्रावासों के संचालन की जानकारी

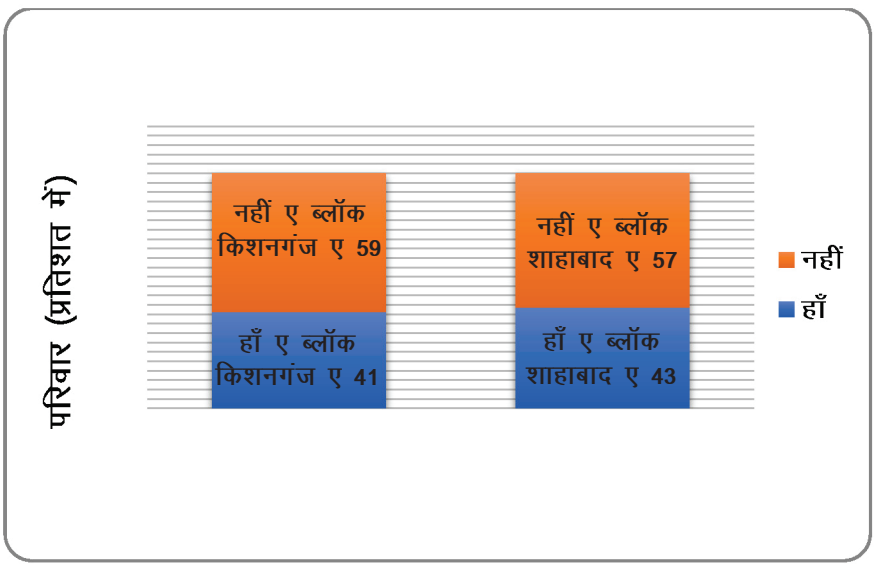


रेखाचित्र– 2 से यह स्पष्ट होता है कि अनुसूचित जनजाति के विद्यार्थियों के शैक्षणिक उत्थान के लिए संचालित आश्रम छात्रावास योजना के संचालन की जानकारी के बारे में चयनित अध्ययन समूह से पूछताछ करने पर किशनगंज तथा शाहाबाद तहसीलों के क्रमशः 72 तथा 90 प्रतिशत सहरिया परिवारों ने योजना के संचालन के बारे में जानकारी रखने की बात को स्वीकारा है। इस प्रकार दोनों तहसीलों में उक्त योजना की जानकारी के सम्बन्ध मेंसहरियों की स्थिति अच्छी मानी जा सकती है क्योंकि दो–तिहाई से अधिक सहरिया आबादी इस योजना के संचालन के बारे में जानकारी रखती है परन्तु तुलनात्मक दृष्टि से देखा जाये तो इस सम्बन्ध में दोनों तहसीलों में पर्याप्त अंतर दिखाई पड़ता है। इस दृष्टि से शाहाबाद के सहरियों की स्थिति किशनगंज के सहरियों की अपेक्षा कहीं अधिक बेहतर नज़र आती है। इस स्थिति के पीछे उत्तरदायी कारणों की खोज करने पर यह ज्ञात होता है कि आश्रम छात्रावासों की अवस्थिति तथा साक्षरता की दृष्टि से शाहाबाद की स्थिति किशनगंज की अपेक्षा अधिक सुदृढ़ हैं।

10. योजनाओं से लाभान्वित

राजस्थान के सघन सहरिया बसावट वाले क्षेत्रोंमें उनके बालक–बालिकाओं के लिए संचालित आश्रम छात्रावास योजना के माध्यम से लाभान्वित होने अथवा ना होने के संबंध में चयनित प्रतिदर्श के सहरिया परिवारों से जुटाए तथ्यों का विश्लेषण करने पर यह स्पष्ट होता है कि किशनगंज तथा शाहाबाद तहसीलों में बसने वाले लगभग एक–तिहाई से अधिक सहरिया परिवार इस योजना से लाभान्वित हुए है।

रेखाचित्र 3 : आश्रम छात्रावासों के संचालन से लाभान्वित सहरिया परिवार



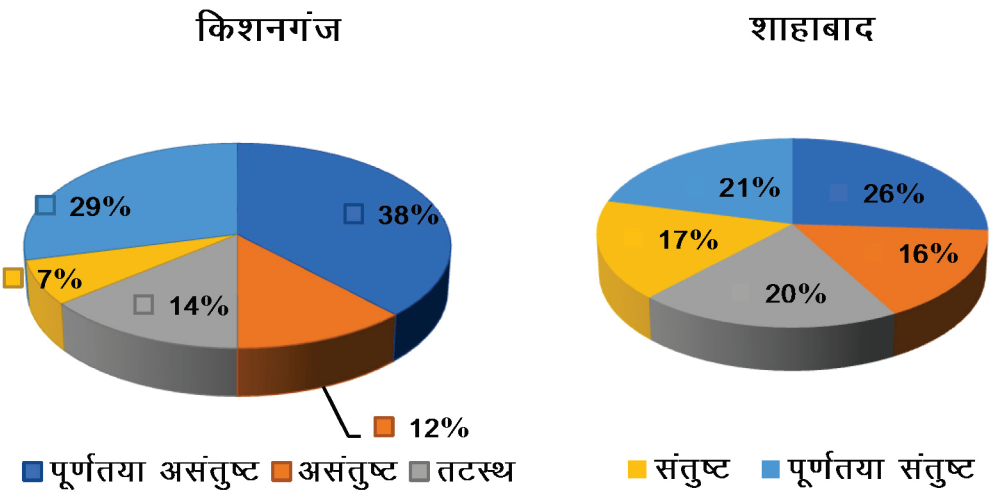
रेखाचित्र– 3 से यह स्पष्ट होता है कि दोनों तहसीलों के क्रमशः 41 तथा 43 प्रतिशत सहरिया परिवारों के बच्चे या तोआश्रम छात्रावासों में अध्ययनरत है या फिर इन छात्रावासों अपनी पढाई पूर्ण कर उक्त योजना से लाभ प्राप्त कर चुके हैं। इस आधार पर दोनों तहसीलों का तुलनात्मक अध्ययन करने पर यह ज्ञात होता है कि दोनों में कोई विशेष अंतर दिखाई नहीं पड़ता है फिर

भी शाहाबाद की स्थिति किशनगंज की अपेक्षा अधिक बेहतर दिखाई पड़ती है। जिसकी मुख्य वजह किशनगंज की अपेक्षा शाहाबाद की उच्च साक्षरता दर तथा सहरिया विकास परियोजना से सम्बंधित विभिन्न प्रशासनिक संस्थाओं का शाहाबाद में स्थित होना है।

11. योजना के संचालन से संतुष्टी

सहरिया जनजाति के बालक–बालिकाओं के शैक्षणिक उत्थान हेतु संचालित आश्रम छात्रावासों की योजना के संचालन से प्राप्त होने वाली संतुष्टि के माप हेतु क्रमवाचक पैमाने के आधार पर प्रश्न बनाकर चयनित प्रतिदर्श से पूछताछ करने पर प्राप्त प्रतिक्रियाओं को योजना से प्राप्त होने वाली संतुष्टि के अनुसार 1 से 5 तक क्रम प्रदान करते हुए उन्हें 1. पूर्णतया असंतुष्ट, 2. असंतुष्ट, 3. तटस्थ, 4. संतुष्ट तथा 5. पूर्णतया संतुष्ट की पाँच अलग–अलग श्रेणियों में को विभक्त किया गया है।

रेखाचित्र 4: आश्रमछात्रावासों के संचालन से संतुष्टी



रेखाचित्र–4 से यह स्पष्ट होता है कि जहाँ एक ओर इन छात्रावासों में भोजन, पेयजल, आवास, वस्त्र तथा शिक्षा की व्यवस्थाओं से दोनों ही तहसीलों के लगभग एक–तिहाई से अधिक सहरिया परिवार या तो पूर्णतया संतुष्ट या फिर केवल संतुष्ट है। वे मानते है कि इन आश्रम छात्रावासों में मुहैया की जाने वाली अधिकांश सुविधाएँ उत्तम कोट्टी की है वही दूसरी ओर किशनगंज तथा शाहाबाद तहसीलों के क्रमशः 50 तथा 42: सहरिया परिवार इन छात्रावासों की व्यवस्थाओं से या तो पूर्णतया असंतुष्ट है या फिर संतुष्ट नहीं है। इनमें से अधिकतर सहरिया परिवार यह मानते है कि इन छात्रावासों में भोजन तथा पेयजल की व्यवस्थाओं में और अधिक सुधार होना चाहिए। यही नहीं किशनगंज तथा शाहाबाद में क्रमशः 14 तथा 20 प्रतिशत सहरिया परिवार आश्रम छात्रावासों की व्यवस्थाओं के प्रति तटस्थ है अर्थात् इस वर्ग के सहरिया परिवार आश्रम छात्रावासों में प्रदान की जाने वाली भोजन, पेयजल, आवास, वस्त्र तथा शिक्षा आदि की सुविधाओं को न तो ठीक और न ही बुरी मानते हैं।

12. निष्कर्ष एवं सुझाव

अनुसूचित जनजाति के छात्र–छात्राओं के शैक्षणिक विकास के लिए संचालित आश्रम छात्रावासों की योजना का राजस्थान की सहरिया जनजाति के संदर्भ में किशनगंज तथा शाहाबाद तहसीलों के सम्बन्ध में प्राथमिक तथा द्वितीयक समंक के आधार पर किया गया उपर्युक्त तुलनात्मक अध्ययन यह निष्कर्ष देता है कि जहाँ एक ओर उक्त योजना के बारे में जानकारी दृष्टि से दोनों तहसीलों का प्रदर्शन उत्कृष्ट रहा है क्योंकि दोनों तहसीलों के दो–तिहाई से अधिक सहरिया परिवार उक्त योजना के संचालन के बारे में पर्याप्त जानकारी रखते है। वंही दूसरी ओर दोनों ही तहसीलों में उक्त योजना से लाभान्वित होने वाले सहरिया परिवारों का अनुपात एक–तिहाई से अधिक के स्तर पर है जो कि इस योजना के संतोषजनक प्रदर्शन को दर्शाता है। इस प्रकार दोनों तहसीलों में उक्त योजना के तुलनात्मक प्रदर्शन की बात की जाये तो शाहाबाद की स्थिति किशनगंज की अपेक्षा अधिक बेहतर दिखाई पड़ती है। क्योंकि सहरिया विकास परियोजना के अंतर्गत संचालित कुल 29 आश्रम छात्रावासों में से 14 शाहाबाद, 10 किशनगंज तथा शेष 05 बाँरा व अटरू तहसीलों में संचालित है। यही नहीं सहरिया विकास परियोजना से जुड़े अधिकांश सरकारी कार्यालय तथा संस्थान शाहाबाद में सीापित है। जनगणना 2011 के अनुसार शाहाबाद की साक्षरता दर (62.79:) किशनगंज की साक्षरता दर (59.42:) की अपेक्षा उच्च स्तर की है। इस प्रकार अपने–अपने क्षेत्रों में संचालित आश्रम छात्रावासों की संख्या, साक्षरता दर तथा सहरिया विकास परियोजना से सम्बंधित सरकारी कार्यालयों एवं संस्थानों की अवस्थिति की दृष्टि से शाहाबाद की स्थिति किशनगंज की तुलना में कहीं अधिक बेहतर है जो कि उक्त योजना के शाहाबाद क्षेत्र के सहरिया परिवारों के अपेक्षाकृत उत्क्रष्ट प्रदर्शन के पीछे प्रमुख रूप से उत्तरदायी है।

बाँरा जिले की किशनगंज तहसील के सहरिया परिवारों के मध्य आश्रम छात्रावासों के सापेक्ष रूप से कमजोर प्रदर्शन को ध्यान में रखते हुए सहरिया विकास परियोजना से जुड़े केंद्र तथा राज्य सरकारों के जन–प्रतिनिधियों, अधिकारियों, कर्मचारियों तथा नीति–निर्माताओं को इस तहसील की ओर अधिक ध्यान आकर्षित करना चाहिये। साथ ही भविष्य में केंद्र तथा राज्य सरकारों को किशनगंज क्षेत्र में साक्षरता दर में वृद्धि तथा जनजातीय समूहों के छात्र–छात्राओं के लिए और अधिक आश्रम छात्रावासों की स्थापना के सुद्रढ़ प्रयास करने चाहिए। इसके अतिरिक्त दोनों तहसीलों में संचालित सभी आश्रम छात्रावासों में भोजन, पेयजल, आवास तथा शिक्षा आदि की व्यवस्थाओं को और अधिक उन्नत करने के प्रयास करने चाहिए जिससे कि वहाँ अध्ययनरत विद्यार्थियों को अपेक्षाकृत बेहतर शैक्षणिक माहौल मिल सकें। प्रस्तुत शोध पत्र में प्रत्येक तहसील से 100 तथा कुल 200 सहरिया परिवारों का प्रतिदर्श लेकर प्राप्त किये गये निष्कर्षों से दोनों तहसीलों के समग्र सहरिया परिवारों के बारे में अध्ययन करना की इसकी प्रमुख सीमा है।

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Environmental Kuznets Curve for Air Quality of Indian States

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Abstract

This study seeks to comprehend the long-term relationship between the quality of air and economic growth as a measure of environmental quality for the Indian States from 2000 to 2019 using panel data analysis. The Environmental Kuznets Curve (EKC) theory for SO_2 emissions has been evaluated to approximate the cubic form equation. The investigation was conducted by categorizing the Indian states according to regions and income levels. The N-shape correlation seen in the empirical results throughout the investigation lends credence to the EKC theory.

Keywords : Sulphur Dioxide, Economic Growth, Air Pollution, Environmental Kuznets Curve

1. Introduction

Air pollution is a significant environmental issue in India, particularly in its major cities and urban areas. It is the outcome of fast economic expansion and, by itself, might be a major roadblock to the nation's economic development. According to the World Air Quality report generated by (IQAir, 2022), "India is home to 39 of the world's 50 most polluted cities in the world, with Delhi ranking as the second most polluted capital city for the fourth consecutive year". The report also revealed that India is the world's largest SO_2 emitter, accounting for more than 21 per cent of global emissions.

In India, sulphur dioxide (SO_2) is a significant local air pollutant that adds to air pollution and its effects. The chemical compound SO_2 is a member of the sulphur oxide chemical family, a hazardous gas with a brief half-life that was classified as a "criteria pollutant" by the US Environmental Protection Agency (USEPA) and the European Commission in 2015. (Kuttippurath et al., 2022). Refineries, power stations, volcanoes, the processing of metals, and the burning of fossil fuels all release it (NAAQS, 2019). According to (Tecer & Tagil, 2013), high amounts of SO_2 in the atmosphere have been shown to worsen air quality and cause acid rain.

The link between economic prosperity and environmental damage has long caused worry on a global scale. As a result, the development economists have linked this steadily increasing environmental pollution to economic growth, and

as a result, theories of sustainable economic growth are gradually replacing them. In addition to economic growth, now solutions for sustainable development are being advocated.

Many studies on the environmental effects of the growth path are now being undertaken in order to understand the relationship between environmental quality and economic development. The Environmental Kuznets Curve (EKC) is thought to be related to per capita income and a number of environmental quality indicators. It argues that during the early stages of economic development, increase in pollutants leads to degradation of the environment, which is followed by the reverse trend, once the per capita income reaches a certain threshold, and economic growth leads to environmental improvement. This translates to an 'inverted U-shape' function of per capita income for the environmental effect indicator. Intriguing is the logical intuition of the EKC connection. Due to a strong emphasis on expanding material output and a general disregard for the environment and early industrialization is distinguished by a sharp rise in pollution (Dasgupta et al., 2002). Rapid growth necessarily increases resource demand and pollution levels, further stressing the environment. At low levels of GDP, people are overwhelmingly poor and uncaring about the effects of expansion of economic activities on the environment. As industrialization advances, environmental consciousness improves the effectiveness of regulatory institutions, resulting in a decline in pollution levels. People develop greater awareness and capability over time. In this setting, it is critical to test the EKC hypothesis. The most popular econometric models for investigating the EKC hypothesis are built with a single variable to represent the effects on ecosystems (which are typically negative) (Xiaoyu et al., 2011). Carbon dioxide (CO_2), sulphur dioxide (SO_2), and nitrogen oxide (NO_2) emissions are the most often utilized indicators of environmental impact (Babu & Datta, 2013). This study makes use of local air pollutant, SO_2 emissions to understand environmental quality of Indian States at the regional level and on the basis of income categories attempts to understand the relation between environmental pollution and economic growth. The study's primary goal is to look into the relationship between pollution and economic growth. The second goal is to see if the shape and turning points of the EKC differ among State types.

The second section reviews the existing body of literature of the EKC studies done for different nations and particularly for India. The third section discusses the methodology used in the paper for estimation of EKC curves for major Indian States. The fourth section describes the empirical estimates of the study, followed by a summary and conclusion of the findings in the final section.

2. Literature Review

The environmental Kuznets curve's validity, applicability, and measurement have been the subject of extensive empirical study since the early 1990s. In its empirical research, the EKC has placed a strong emphasis on identifying whether a specific indicator of environmental deterioration has an inverted U-shaped relationship with per capita income levels.

The pioneers in demonstrating a relationship between environmental quality and economic growth were (Grossman et al., 1991). They explored the EKC link in the context of the disputed North American Free Trade Agreement using the Global Environment Monitoring System (GEMS) dataset. They evaluated the association between air quality and economic growth using a cross-sectional sample of comparable air pollution variables for metropolitan locations in 42 countries. SO_2 and black matter (fine pollution) concentrations increased with per capita GDP at low-income levels but declined with GDP at higher income levels, demonstrating an inverted U-shaped connection.

Using World Bank cross-country time-series data, (Shafik and Bandyopadhyay, 1992)determined the association between economic development and ten distinct environmental quality measures. Consistently significant correlations were discovered between income and environmental quality parameters. Initially, levels of SO_2, Suspended Particulate Matter (SPM), and faecal coliform increased as income rose from low levels, but they reduced as income reached a certain level.

(Selden & Song, 1994) Using data from industrialised nations, environmental Kuznets curves were created for four emission series (SO_2, NOX, SPM, and CO). They used data from the World Resources Institute (WRI) that was collected throughout time. They determined that the emission threshold is most likely higher than the ambient air concentration threshold.

(Panayotou, 1995) analysed the EKC connection between deforestation, SO_2, NOX, and SPM. He utilized data from 41 tropical, predominantly developing nations from the mid-to-late 1980s for deforestation and data from 55 countries (both developed and developing) for sulphur dioxide and nitrogen oxide emissions from the mid-to-late 1980s. He discovered that the income turning point for deforestation occurred considerably earlier than emissions. In contrast to the era of intensive industrialization, deforestation for agricultural expansion or logging was more common during the early phases of economic development.

A study carried out by (Babu & Datta, 2013) analysed the Environmental Kuznets Curve for panel data from 22 developing countries. The EKC was obtained using

an index to represent the dependent variable, in form of a more broad measure of Environmental degradation consisting of sub-indices such as Air, Water, Soil, Forest and ores. Also, the study used two different independent variables, such as per capita GDP and the development balance Index to obtain the curve.

(Adhikary and Hajra, 2021)examined the form of the Environmental Kuznets Curve for six SAARC nations using panel data from 1980 to 2014. In order to determine the form of the Environmental Kuznets Curve in the SAARC region and in selected SAARC countries, the Composite Environmental Degradation Index (CEDI) was established and its relationship with per capita income was studied.

Similarly, there have been many studies done on Environmental Kuznets Curve around the world. To limit the focus of the literature in the study, table 1 displays an exhaustive list of significant studies pertaining to India.

When investigating the relationship between economic expansion and environmental pollution, one major shortcoming of present research is that it has mostly concentrated on national perspectives, with little consideration given to regional perspectives. It is critical to define the relationship between regional economic growth and environmental damage because regional and economic division is a significant impediment to efficient pollutant emission regulation due to the close relationship between various economic conditions and industrial structures and local emission patterns and trends. (Jiang, M., Kim, E., & Woo, 2020). Although these studies have considered variations in emission between States, none has considered how different income levels affect emission. In this study, the authors have attempted to use the EKC framework to analyse the income and emissions relationship by categorising Indian States into four groups based on location and income groups.

3. Data and Methodology

Investigating the relationship between economic development and environmental quality is the primary objective of the current study. Using panel data from 20 major Indian States, the technique focuses on assessing the EKC hypothesis at the state level categorised on the basis of (i) Income Level and (ii) Geographical Location.

3.1 Data

The current study's empirical investigations are based on data series for 20 Indian States for air quality across the sample period (2000-2019). These States are Andhra Pradesh (AP), Bihar (BH), Chattisgarh (CH), Goa (GO), Gujarat (GU),

Haryana (HY), Himachal Pradesh (HP), Jharkhand (JK), Karnataka (KR), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Orissa (OR), Punjab (PB), Rajasthan (RJ), Tamil Nadu (TN), Telangana (TL), Uttar Pradesh (UP), Uttarakhand (UK) and West Bengal (WB). The availability of data for appropriate observations, which is required for empirical study, determines the sample time and space.

The data for this study came largely from secondary sources, such as the Central Pollution Control Board (CPCB), Delhi's National Ambient Air Quality Statistics/Status of India. The Reserve Bank of India website was used to compile the Net State Domestic Product (NSDP) of Indian States from 2000-2001 to 2019-20 at constant 2011-12 prices.

3.2 Methodology

In order to estimate the EKC hypothesis in this study, a cubic functional form (specified below) was employed by the authors to analyse the connection between per capita income and air pollution, similar to (Barua & Hubacek, 2008; Grossman & Krueger, 1995; Shafik, 1994), and many other studies. The cubic form offers a relationship with a simple quadratic form (U-shaped), but it also permits a second turning point.

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it}^2 + \beta_3 X_{it}^3 + \varepsilon_{it} \quad (1)$$

Y_{it} is the Pollutant for i^{th} State at t^{th} period

X_{it} is the per capita Net State Domestic Product (NSDP) of i^{th} State

ε_{it} relates to random variable of influence on environmental degradation.

$t = 1, 2\ldots\ldots, 19; i = 1, 2\ldots n$

In the above equations, Y_{it} represents the quality of the environment, represented by emissions i.e., the air quality in the state i for the year t.

In the current study, SO_2 is used as a proxy environmental quality indicator that was taken into consideration. The annual average of SO_2 concentration for various monitoring stations for the States are used for calculation in equation (1). Instead of individual station observations.

State mean data from both industrial and residential locations have been used. Then the variables were transformed by taking the logarithm.

To test the environment-economic development relationship, EKC has been estimated using the model given above. The present study is limited to cubic form

of equation, therefore, the possibilities of various shapes of EKC can be in the following forms:

1. If the coefficients are such that, $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 < 0$, It implies that the EKC will follow a reversed 'N' shape, with environmental deterioration increasing initially, turning upward (second stage), and then increasing once more (third stage) as per capita GDP grows. As a result, it is possible that the GDP per capita level at which the second turning point occurs is lower, which is
   $d\left(\frac{(dX_{it}/dY_{it})}{dY_{it}}\right) = 0$ Thus, $2\beta_2+3\beta_3 Y_{it}=0$ and we get $Y_{it}= -(2\beta_2/3\beta_3)$ after which the environmental degradation starts increasing again with rising per capita GDP.

2. If the coefficients are $\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 > 0$, then following its decline (first stage), environmental degradation then takes a turn downhill (second stage), followed by another drop (third stage), along with the rising per capita GDP. Consequently, it follows that the EKC will be a typical 'N'-shaped curve. The GDP per person level at which the second turning point is discovered
   $d\left(\frac{(dX_{it}/dY_{it})}{dY_{it}}\right) = 0$ Thus, $2\beta_2 + 3\beta_3 Y_{it} = 0$ and we get $Y_{it} = -(2\beta_2/3\beta_3)$ then, when the per capita GDP rises, environmental degradation starts to increase once more.

The above model allows us to examine a variety of environmental variables, including economic growth relationships, and EKC. To analyse this relationship, the study categorises the States on the basis of two categories, (i) on the basis of income and (ii) region. This categorisation of States has been done to perform a disaggregated analysis as the previous studies have been either done on India at national level or individual States/ cities. The classification of States into various categories have been shown in the Table 3.

Thus, a total of eight models have been estimated for the environmental pollution indicator, i.e., SO_2. The income wise categories are Low, Medium, High and Very High per capita income divided on the basis of quartiles of per capita income. Similarly, the region wise categories are North, South, East and West divided on the basis of geographical location of states.

The fixed effects (FE) and random effects (RE) models were used as estimate strategies in this study. The Hausman test is also used to determine whether fixed or random effects are preferable. When assessing the effects of variables that change over time, the fixed effects estimating approach is used. The fixed effects model analyses the link between predictor and result variables inside an entity. The fixed effects model also takes into account all time-invariant variations to

ensure that omitted time-invariant characteristics do not distort the estimated coefficients of the fixed effects models. The basic goal of FE models is to identify the sources of changes inside an entity(Torres-Reyna, 2010). The random effects model assumes that variations in the entity are unrelated to the model's explanatory factors. The random effects estimator also gives estimates for time-constant covariates. In the RE model, the error term is based on distributional assumptions, and an estimating technique is employed to remove extraneous factors.The random effects are estimated using a pooled-GLS estimator (Bruderl, 2005). The Hausman test is used to distinguish between models with fixed and random effects. It is used to decide which of the two models is preferable. The Hausman test evaluates whether or not there is a correlation between the error terms and the regressors (Oshin & Ogundipe, 2015).

4. Discussion and Results

Model 1: SO_2 and States categorised on per capita income (PCI)

We first estimate the simple cubic equation for SO_2 with income categories in the Table 4.

Model 1 represents the relationship between SO_2 as a proxy of environmental quality and NSDP per capita as a representative of economic growth to study EKC when the States are being divided on the basis of various income categories. Model 1.1 represents the Low per capita income States, Model 1.2 shows Medium per capita income States and Model 1.3 and 1.4 represents High and Very High respectively. The Hausman test's outcome for model 1.1, 1.2, 1.3 and 1.4 indicates that the random effect hypothesis has been approved at the values 0.622, 0.995, 0.7646 and 0.9969 respectively, hence it has been applied to all SO_2 concentration models. At the 5per cent level of significance, it is determined that the coefficient of lnX for sulphur content is 34.47, the coefficient of lnX^2 is -3.706 and coefficient of lnX^3 is 0.129. The model is significant with a probability value of F-test equal to 0.00 and an R2 of 0.8177, which suggests that 81.77 per cent of the variation of the dependent variable is explained by the model. For sulphur concentration, the first turning point appears to be at ₹ 59353.21 and the second turning point at ₹ 20085.55 has been computed.

According to the outcome for the middle-income group (Table), the cubic model of sulphur content shows that the coefficients of lnX, lnX^2 and lnX^3 are -134.395, 11.729 and -0.341 respectively and all are found to be highly significant at the 1per cent level of significance. The model is significant with an R^2 of 0.544 and an F-test probability value of 0.00.

The results for model 1.3 i.e., States with high per capita income indicate a N-

shaped pollution-income link. The coefficient of the cubic equation comes to be 423.8167, -36.962 and 1.0727 respectively for lnX, lnX^2 and lnX^3. The model is found to be significant with R2 0.7644 and *p* value of 0.00 of F- statistic. This suggests that the sulphur concentrations follow the N shaped EKC and after reaching an income level of ₹ 102736.3, a fall in the level of air pollution and after ₹ 2286.108, it will cause the concentration of sulphur to increase.

The last category of States represented by Model 1.4, i.e., States categorized as Very High per capita income States also approves the Random effect model. For sulphur content, the coefficients of lnX, lnX^2 and lnX^3 are -7.018, 0.2951 and 0 respectively, all of which are shown to be highly significant at the 1 per cent level of significance which represents an inverted U-shaped curve. For this income category, ₹117465.1 and ₹57183.81 marks the turning point. The model is significant with an R2 of 0.6413 and a probability value of 0.00 for the F-test.

Model 2: SO_2 and States categorised on regions.

We then estimate the simple cubic equation for SO_2 with region wise categories in the Table 5.

The Model 2 represents the relationship between SO_2 as a proxy of environmental quality and NSDP per capita as a representative of economic growth to study EKC when the States are being divided in various regions. Model 2.1 represents the North region, Model 2.2 shows South region and Model 2.3 and 2.4 represents East and West regions respectively. In each of the regions, depending on the results of the Hausman test, the random effect model (RE) and fixed effect model (FE) have been applied. To understand the type of link between the variables under study the cubic form of the equation has been examined. The Hausman test's outcome indicates that the Random Effect hypothesis has been accepted, with Hausman test values of 0.83, 0.99 and 0.36 for Models 2.1 and 2.2 and 2.3, respectively Whereas Model 2.4 Hausman test value 0.00 represents rejection of Random effect hypothesis and thus fixed effect model has been applied. In model 2.1, 2.3 and 2.4 the cubic form of the equation demonstrates the existence of a N-shaped relationship which indicated first at the initial level of income sulphur concentration first decreases, then starts rising with further rise in income and at last after reaching some threshold level again starts to decline. With the coefficient of lnX, its square and cube are statistically significant at the 1per cent level of significance. The model's significance given by R2 are 82.3 per cent, 78.27 per cent and 71.4 per cent respectively and the likelihood of the F-test passing is 0.00. In model 2.2 cubic form of equation has been checked to confirm the relationship which shows the existence of inverted N shaped relationship with coefficient of lnX, lnX^2 and lnX^3 having values -145.7, 12.906 and -0.382 respectively at a 10 per cent level of significance, the coefficients of lnX^2 and lnX^3

are statistically significant, whereas the coefficient of lnX is statistically significant at a 5 per cent level of significance. The required income for the first turning point is ₹ 53423.42 and it is Rs. ₹ 1019560 for the second turning point, after which the economy may begin to lower its sulphur concentration. Since Model 2.2's turning points occur at extremely small or even negative y values, we disregard them as they are insignificant. We only contemplate higher turning points. The results do not suggest a significant N-shaped relationship between y and e.

5. Conclusion

The study seeks to determine the existence of the Environmental Kuznets Curve (EKC) in order to examine the relationship between economic growth and air pollution. Using panel data from 20 major Indian States, the study focuses on evaluating the shape of EKC hypothesis at the state level. A total of eight models have been estimated for SO_2 as an environmental pollution indicator. The income wise categories are Low, Medium, High and Very High per capita income divided on the basis of quartiles of per capita income. Similarly, the region wise categories are North, South, East and West divided on the basis of geographical location of states. In order to estimate the EKC hypothesis in this study, a cubic functional form was employed by the authors to analyse the connection between per capita income and air pollution. Both Fixed effect and Random effect model have applied as per the results of Hausman test. The N shaped curve appeared for North, East and West regions in SO_2 while in case of income categories, the N shaped curve appeared in Low and High Per capita Income States. The Medium and Very high-income categories of states show Inverted N and Inverted U shaped EKC curve where in case of the Southern states its again Inverted U shaped curve. So, we can say that overall, the majority of the state's exhibit N shaped EKC curve, thereby showing 2 turning points each."The N-shaped EKC suggests that the original EKC hypothesis will not hold in the long run. Instead, beyond a certain income level, increased income might once again lead to a positive relationship between economic growth and environmental degradation" (De Bruyn et al., 1998).The results indicate that long-term energy conservatism and increased spending on SO_2 emissions reduction may be pursued by the Indian government without slowing down the country's economic expansion. These could include implementing desulfurization, imposing a tax on sulphur emissions, phasing out the use of coal in favour of cleaner energy sources like natural gas, nuclear, renewable, and hydrogen energy, as well as other pollution control policy measures and their effective implementation.

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Appendix

Table 1: Summary Literature Review of EKC studies done on India.

Studies supporting inverted U – shaped EKC				
Authors	**Scope**	**Time Period**	**Data**	**Environmental Variable**
(Mohapatra et al., 2009)	15 major Indian States	1991-2003	Cross-section & time series	SO_2, NO_2, SPM
(Kanjilal & Ghosh, 2013)	India	1971 to 2008.	Time series	CO_2 emissions
(Husain, 2016)	India and Bangladesh	(1981 – 2011)	Time Series	CO_2 emissions, NO_2 emissions
(Sinha & Bhattacharya, 2016)	139 cities in India	2001–2013	Panel data	SO_2 and NO_2
(Al-Mulali et al., 2017)	India and China	1965–2013	Time series	CO_2 emissions
(Sinha et al., 2019)	India	1971-2015	Time series	CO_2 emissions
(Sinha & Bhatt, 2017)	India	1960- 2010.	Time series	CO_2 emissions
(Ashraf et al., 2018)	Uttarakhand	1990 to 2014	Time series	Livestock, forest cover.
(Usman et al., 2019)	India	1971–2014	Time series	CO_2 emissions
(Behera, 2021)	India	1971 to 2016	Time series	CO_2 emissions
(Gopakumar et al., 2022)	India	1991-2018	Time series	CO_2 emissions
Studies supporting N – shaped EKC				
(Barua & Hubacek, 2008)	16 States of India	1981 to 2000		BOD, COD
(Makarabbi et al., 2018)	India	1978-2015	Time series	CO_2 emissions
(Pal & Mitra, 2017)	India and China	1971–2012	Time series	CO_2 emissions
(Sinha, 2017)	India	1970 to 2010	Time series	CO_2 emissions
(Bhanu Murthy & Gambhir, 2018)		1991 to 2014	Time series	CO_2 emissions
(Bandyopadhyay & Rej, 2021)	India	1978–2019	Time series	CO_2 emissions
(Vaidya, 2023)	India	1990-2016	Time series	CO_2 emissions
Studies not supporting EKC				
(Gurumurthy & Mukherjee, 2011)	States of India	1990–1991 to 2005-06	Panel data	BOD and PH
(Khajuria & Matsui, 2011)	India	1947-2004	Time series	Municipal solid waste
(Hauff & Mistri, 2015)	Indian States	2001-2012	Panel Data	Quality of Water
(Khed, 2016)	India	1991-2014	Time series	CO_2 emissions
(Kundu, 2016)	India	1960-2011	Time series	CO_2 emissions
(Alam & Adil, 2019)	India	1971–2016	Time Series	CO_2 emissions
(Adamu et al., 2019)	India	1983 to 2014	Time series	CO_2 emissions

Source: Compiled by Author

Table 2: Definition of Variables

Variable	Definition		Source
Y		Net Domestic Product of Indian States from 2000-2001 to 2019-20 at constant 2011-12 prices	Reserve Bank of India website
X	Model 1& 2	Annual Average Concentrations of SO_2	Central Pollution Control Board (CPCB) website

Source: Author Computation

Table 3: Categorization of States

Categorisation based on Income	
Low PCI	Jharkhand,Orissa, West Bengal, Madhya Pradesh, Bihar, Uttar Pradesh
Medium PCI	Andhra Pradesh, Chhattisgarh, Punjab, Rajasthan, Telangana
High PCI	Gujarat, Himachal Pradesh, Karnataka, Tamil Nadu, Uttarakhand
Very High PCI	Goa, Haryana, Kerala, Maharashtra
Categorisation based on region	
North	Punjab, Haryana Uttar Pradesh, Himachal Pradesh, Uttarakhand
South	Kerala, Andhra Pradesh, Tamil Nadu, Telangana, Karnataka
East	Bihar, Jharkhand, Chhattisgarh, West Bengal, Orissa
West	Goa, Maharashtra,Gujarat, Rajasthan, Madhya Pradesh

Source: Author Computation

Table 4: Model 1

	Low	Medium	High	Very High
Model	**1.1**	**1.2**	**1.3**	**1.4**
Model Type	**RE**	**RE**	**RE**	**RE**
Constant	-100.521	515.751	-1614.882	43.801
logx	34.47	-134.395	423.8167	-7.018
$Logx^2$	-3.706	11.729	-36.962	0.2951
$Logx^3$	0.129	-0.341	1.0727	0
R^2	0.8177	0.544	0.7644	0.6413
Adjusted R^2	0.8029	0.507	0.7455	0.6077
F statistic	55.49	14.85	40.33	19.07
Prob> F	0.00	0.00	0.00	0.00
N - shaped EKC	Yes	No	Yes	No
Hausman Test	0.622	0.995	0.7646	0.9969
Turning point 1	₹ 59353.21	-	₹ 102736.3	₹ 117465.1
Turning point 2	₹ 20085.55	-	₹ 2286.108	₹ 57183.81

Source: Author Computation

Table 5: Model 2

	North	South	East	West
Model	**2.1**	**2.2**	**2.3**	**2.4**
Model Type	**RE**	**RE**	**RE**	**FE**
Constant	-16.549	552.743	- 429.156	- 391.558
logx	9.595	-145.703	129.167	102.375
$Logx^2$	-1.241	12.906	- 12.785	- 8.830
$Logx^3$	0.476	- 0.382	0.4188	0.252
R^2	0.823	0.6212	0.7827	0.7140
Adjusted R^2	0.808	0.5907	0.7639	0.6898
F statistic	57.14	20.38	41.68	29.60
Prob> F	0.00	0.00	0.00	0.00
N- shaped EKC	Yes	No	Yes	Yes
Hausman Test	0.8332	0.994	0.3638	0.00
Turning point 1	₹ 53423.42	-	₹ 60373.43	₹ 332584.4
Turning point 2	₹ 1019560	-	₹ 22269.78	₹ 66715.89

Source: Author Computation

Covering Letter for Submission of Manuscript

The Editor,

Rajasthan Economic Journal (REJ)

Subject: Submission of Manuscript in the Area of ……..

Dear Sir,

Please find my submission of manuscript titled…….……
……...……
…….……
for possible publication in your journal. I hereby affirm that the contents of this manuscript are original. Furthermore it has neither been published elsewhere in any language fully or partly, nor it is under review for publication anywhere.

I affirm that the author(s) have seen and agreed to the submitted version of the manuscript and their inclusion of name(s) as co-author(s).

I am enclosing herewith the Cheque/DD/NEFT details of Rs. 2000/- (Rupees Two Thousand Only) in favour of Rajasthan Economic Association, payable at Jaipur, as submission fee.

Name of Corresponding Author(s):

Designation:

Affiliation with full address:

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Mobile No:

Email Address:

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Signature

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All the authors are requested to follow the below-listed guidelines for the manuscript submission in the Rajasthan Economic Journal:

1. Manuscript Title: The title of the paper should be in 14 font size and Times New Roman font. It should be bold typed and centre aligned.

2. Author(s) Name: The author(s) full name should be in 12 font size and Times New Roman font. Please do not mention any prefix before the name. Mark * on the name and give details such as designation, institution, e-mail address below the name.

3. Abstract: Abstract should be fully italicised and in 12 font size and Times New Roman font not exceeding 250 words. The abstract should explain the objectives, methodology, and a brief summary.

4. Headings: All the headings should be in 12 font size and Times New Roman font. It must be bold-faced, left aligned and in title case.

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6. Main text: The main text should be in 12 font size and Times New Roman font. The text should be double-spaced and justified.

7. Tables: Tables should be consecutively numbered having its title at the top and source at the bottom. All tables should be placed at the last after references in the appendix.

8. References: The references should be in APA format and alphabetically arranged. It must be double-spaced and justified having a hanging indentation. The authors should mention only cited references in the manuscript. The references or works cited should be properly cited in the text of the manuscript.

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Surname followed by name (year), title in italics, name of the publisher, place and in case of online book retrieved from url. In case of a chapter in a book, the page no (pp-pp) should be mentioned. ***E.g.***

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FORM IV

(See Rule – 8)

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I, Prof. V. V. Singh hereby declare that particulars given above are true to the best of my knowledge and belief.

Date: July 2021 Signature