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PERFORMANCE OF SUSTAINABLE DEVELOPMENT GOALS IN DIFFERENT GOVERNANCE: AN INVESTIGATIVE STUDY IN THE CONTEXT OF INDIA

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ABSTRACT:

India is a blend of states and union territories, each characterized by distinct development trajectories, economic structures, and cultural and social dynamics. The federal structure of governance in India allocates responsibilities and powers differently across states and union territories. In this study, we attempt to assess whether there exists any significant difference in the performance of Sustainable Development Goals (SDGs) between two groups: states of India and Union Territories of India, as the governance of these two groups differs. For this, we have extracted data from the NITI Aayog Report 2023-24 on SDG. Firstly, we calculated the mean and Standard Deviation for all states as a group and UTs as another group. Then we carried out Levene's Test to check equality of variances. We also applied independent t-test by grouping and categorized the data based on the results of Levene's Test, i.e, with the assumption of equal variance and not having equal variance. Our results suggest that, except for SDG 1, there is no significant difference between the two groups. We also identified the best and worst performers for each of the SDGs in these two groups.

Key Words: Sustainable Development Goals, Governance, Performance, independent t-test, Levene's Test

1. INTRODUCTION

In 2015, the United Nations General Assembly passed UN Resolution 70/1, making achievement of the Sustainable Development Goals by 2030 official UN policy. Together, the 17 goals and 169 targets of the SDGs constitute an all-inclusive agenda for sustainable development. The SDGs touch not just on environmental justice and intergenerational justice, but also on equitable economic growth and social stability, shaping development priorities around the needs of the disadvantaged, and designing just and robust institutions (Bajpai & Biberman, 2020).The 2030 Agenda set by the UN emphasizes the 5Ps, which are people, prosperity, planet, partnership, and peace(Mishra et al., 2025).

Numerous single indicators have been established to monitor progress toward sustainable development; however, the need for benchmarking the degree of sustainability of countries triggered the creation of the SDG Index, which originally compiled 77 indicators (Diaz-Sarachaga et al., n.d.-a) with India at 62 indicators. India has included many indicators over time and in the latest Index, India has considered 113 indicators. A composite index integrates multiple indicators into a single summary measure, reflecting the overall performance of a country/region. Such an index highlights where a country/region actually stands in the global platform or within the nation. A set of indicators is picked for each Goal (and for some, associated targets) from the *National Indicator Framework* (NIF), which is India's adaptation of global SDG indicators. For each indicator, the performance of each

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Journal Website: www.nrjbe.in

State / Union Territory is normalized to a 0–100 scale. A score of 100 means that the target (usually the 2030 target) is achieved; lower scores reflect how far the state is from that target. Till now, NITI Aayog has come up with four reports: the Baseline Report 2018, the 2019-20 edition, 3rd the 2020-21 edition, and the very recent 2023-24 edition. A study (Diaz-Sarachaga et al., n.d.-b) shows that the scores obtained through the application of this index clustered UN countries according to specific geographic areas, highlighting the need for developing regional SDG Indices to emphasize the achievement of lower-performing goals. Another study (Parekh & Lal, 2024) highlights the benefits and challenges of adopting an indexing or ranking approach to monitor the sub-national level progress made for the attainment of SDGs.

India is a mixture of states and union territories, each characterized by distinct development trajectories, economic and cultural structures, and social dynamics. The federal structure of governance in India allocates responsibilities and powers differently across states and union territories. A comparative study allows for a coarse analysis, separating the specific factors influencing SDG outcomes in different regions. Understanding the different shades of development at the state and union territory levels is essential for crafting targeted and effective policies. It is also pertinent to compare the performances by comparing peer groups of geographical regions based on governance and control. The successful implementation of Sustainable Development Goals (SDGs) in the diverse territorial governance of Indian states and union territories is intricately tied to the political dynamics that shape governance structures, policy decisions, and the allocation of resources. While commentaries often lament the lack of political will to "transform our world", there is little analysis of country-level politics around the Sustainable Development Goals (SDGs)(Beisheim et al., 2025). Hence, there is a need to carry out studies at the country level.

In the federal structure of India, states and union territories enjoy a degree of autonomy in decision-making and policy implementation. The political dynamics within each region, therefore, are assumed to impact the effectiveness of SDG initiatives. Political decisions related to resource allocation, budget priorities, and the formulation of development policies directly influence the progress towards achieving the SDGs.

Governance must be a crucial part of the Sustainable Development Goals (SDGs).Much of the discussions for the SDGs has revolved around either having a stand-alone governance goal or integrating governance into other goals on specific issues.Three aspects of governance need to be considered: good governance (the processes of decision-making and their institutional foundations), effective governance (the capacity of countries to pursue sustainable development), and equitable governance (distributive outcomes). While these three different aspects have some connections between them, each will require separate political efforts(Kanie & Biermann, 2017). Sub-national governments play an essential role in transforming existing governance to deliver on the Sustainable Development Goals (SDGs)(Kandpal & Okitasari, 2023).

Moreover, the political dynamics influence the prioritization of specific SDGs based on the prevailing issues and public sentiment in a given state or union territory. Some regions may prioritize poverty alleviation and climate change, while others may focus on environmental sustainability or healthcare. This variation is reflective of the diverse socio-economic challenges and political requirements and priorities across the nation.

The state-wise index helps to understand the key areas where policymakers should pay attention to. The index shows the clear disparity between Indian states, and a lot must be done to achieve uniform success across states(Panda et al., 2018). The relationship between

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Journal Website: www.nrjbe.in

political dynamics and SDG implementation cannot be not one—dimensional. It is expected to involve a complex interplay of factors such as governance effectiveness, political stability, and the alignment of development goals with the broader vision of leading political parties. As the political landscape evolves, the study of these dynamics becomes integral to understanding the challenges and opportunities in achieving sustainable development objectives at the regional level. Hence this study has made an attempt to find whether the SDG progress has been uniform across states and union territories of India due to differences in governance.

3 A. OBJECTIVES OF RESEARCH

i. To identify if there exist any significant differences between the States and Union Territories of India in each SDG

ii. To identify the best and worst performers in each SDG within the States and within the Union Territories.

B Hypothesis

$H0_{01}$: There are no significant differences in the variances of scores between the states and union territories in SDG1

$H0_{02}$: There are no significant differences in the variances of scores between the states and union territories in SDG2

$H0_{03}$: There are no significant differences in the variances of scores between the states and union territories in SDG3

$H0_{04}$: There are no significant differences in the variances of scores between the states and union territories in SDG4

$H0_{05}$: There are no significant differences in the variances of scores between the states and union territories in SDG5

$H0_{06}$: There are no significant differences in the variances of scores between the states and union territories in SDG6

$H0_{07}$: There are no significant differences in the variances of scores between the states and union territories in SDG7

$H0_{08}$: There are no significant differences in the variances of scores between the states and union territories in SDG8

$H0_{09}$: There are no significant differences in the variances of scores between the states and union territories in SDG9

$H0_{10}$: There are no significant differences in the variances of scores between the states and union territories in SDG10

$H0_{11}$: There are no significant differences in the variances of scores between the states and union territories in SDG11

$H0_{12}$: There are no significant differences in the variances of scores between the states and union territories in SDG12

$H0_{13}$: There are no significant differences in the variances of scores between the states and union territories in SDG13

ISSN: 2349-2015
Peer Reviewed & Refereed Journal (IF: 6.74)
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$H0_{14}$: There are no significant differences in the variances of scores between the states and union territories in SDG15

$H0_{15}$: There are no significant differences in the variances of scores between the states and union territories in SDG16

$H0_{16}$: There are no significant differences in the mean scores between the states and union territories in SDG1

$H0_{17}$: There are no significant differences in the mean scores between the states and union territories in SDG2

$H0_{18}$: There are no significant differences in the mean scores between the states and union territories in SDG3

$H0_{19}$: There are no significant differences in the mean scores between the states and union territories in SDG4

$H0_{20}$: There are no significant differences in the mean scores between the states and union territories in SDG5

$H0_{21}$: There are no significant differences in the mean scores between the states and union territories in SDG6

$H0_{22}$: There are no significant differences in the mean scores between the states and union territories in SDG7

$H0_{23}$: There are no significant differences in the mean scores between the states and union territories in SDG8

$H0_{24}$: There are no significant differences in the mean scores between the states and union territories in SDG9

$H0_{25}$: There are no significant differences in the mean scores between the states and union territories in SDG10

$H0_{26}$: There are no significant differences in the mean scores between the states and union territories in SDG11

$H0_{27}$: There are no significant differences in the mean scores between the states and union territories in SDG12

$H0_{28}$: There are no significant differences in the mean scores between the states and union territories in SDG13

$H0_{29}$: There are no significant differences in the mean scores between the states and union territories in SDG15

$H0_{30}$: There are no significant differences in the mean scores between the states and union territories in SDG16

III. METHODOLOGY

Type Of Research: Analytical

Area Of Research : Two Territorial Groups Based On Governance : I) All States of India II) All Union Territories of India .

Type Of Data: Secondary. Data Extracted From SDG India Index 2023-24, NITI Aayog

Tools used :

ISSN: 2349-2015
Peer Reviewed & Refereed Journal (IF: 6.74)
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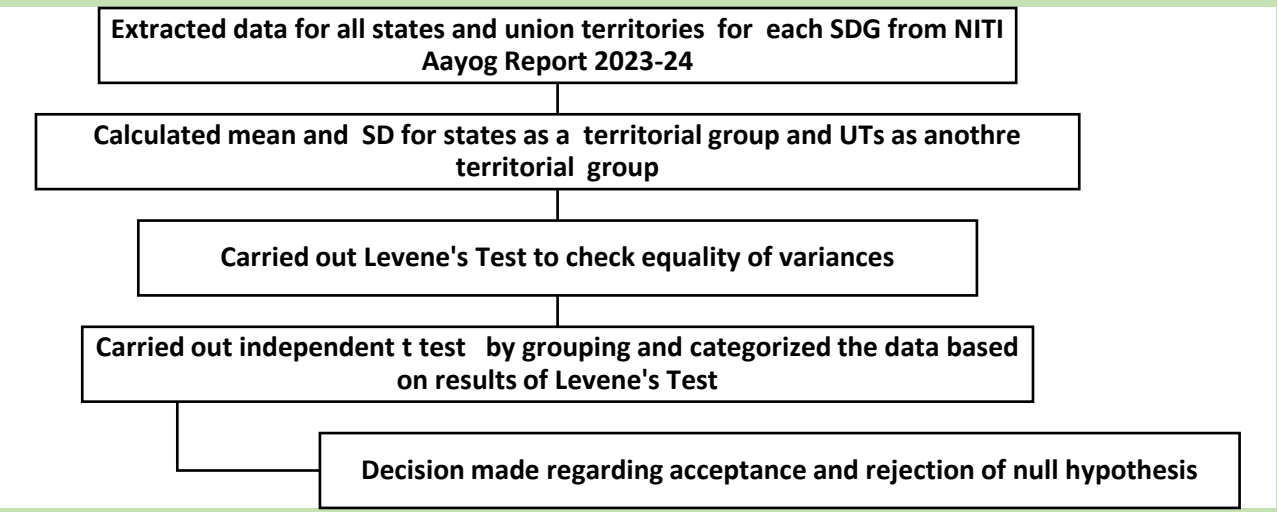
Levene's Test

Independent sample t test with grouping

Research Flow Chart



Source: Prepared by the Researchers

IV. RESULTS AND DISCUSSION

TABLE 5.1: Results of Levene's Test for variances

SDG		F	Sig*	Decision
SDG 1	There are no significant differences in the variances of scores between the states and union territories in SDG1	7.83	.008	Reject H_0
SDG 2	There are no significant differences in the variances of scores between the states and union territories in SDG2	.583	.450	Accept H_0
SDG 3	There are no significant differences in the variances of scores between the states and union territories in SDG 3	.164	.688	Accept H_0
SDG 4	There are no significant differences in the variances of scores between the states and union territories in SDG 4	.063	.804	Accept H_0
SDG 5	There are no significant differences in the variances of scores between the states and union territories in SDG 5	.680	.415	Accept H_0
SDG 6	There are no significant differences in the variances of scores between the states and union territories in SDG 6	.103	.750	Accept H_0
SDG 7	There are no significant differences in the variances of scores between the states and union territories in SDG 7	.297	.589	Accept H_0
SDG 8	There are no significant differences in the variances of scores between the states and union territories in SDG 8	1.615	.212	Accept H_0

ISSN: 2349-2015
Peer Reviewed & Refereed Journal (IF: 6.74)
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SDG 9	There are no significant differences in the variances of scores between the states and union territories in SDG 9	2.218	.146	Accept H_0
SDG 10	There are no significant differences in the variances of scores between the states and union territories in SDG 10	.000	.990	Accept H_0
SDG 11	There are no significant differences in the variances of scores between the states and union territories in SDG 11	.168	.685	Accept H_0
SDG 12	There are no significant differences in the variances of scores between the states and union territories in SDG 12	3.572	.067	Accept H_0
SDG 13	There are no significant differences in the variances of scores between the states and union territories in SDG 13	2.346	.135	Accept H_0
SDG 15	There are no significant differences in the variances of scores between the states and union territories in SDG 15	1.278	.266	Accept H_0
SDG 16	There are no significant differences in the variances of scores between the states and union territories in SDG 16	2.275	.141	Accept H_0

Source: Researchers' calculation; * Calculated at 5 percent level of significance

The Levene's test was applied, which is generally used to test for equality of variance in a dataset. It is used to determine if two or more samples have equal variances. If the results of the test indicate that the samples do not have equal variances, then it means that one sample has a different variance than the other sample.

Here, our first group of sample are the states and the second group consists of all the Union Territories. On applying Levene's test based on the Standard Deviation [standard deviation is the square root of the variance, and conversely, the variance is the square of the standard deviation], we had two categories for assumption: equal variances and unequal variances based on significance. Only in SDG 1 , null hypothesis was rejected i.e we proceeded with the unequal variance assumption. For the rest of the SDGs we proceeded with t-test with equal variance assumption, as our results in Table 5.1 showed that the differences were not significant.

TABLE 5.2 : RESULTS OF t TEST

Null Hypothesis	$\|t\|$	Sig(2 tailed)**	Decision
Ho: There is no significant difference between states and UTs in the performance of SDG1	2.036	.05	Reject H_0
Ho: There is no significant difference between states and UTs in the performance of SDG2	1.572	.125	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG3	1.356	.184	Accept H_0

ISSN: 2349-2015
Peer Reviewed & Refereed Journal (IF: 6.74)
Journal Website: www.nrjbe.in

Ho: There is no significant difference between states and UTs in the performance of SDG4	1.344	.188	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG5	1.129	.267	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG6	1.077	.289	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG7	.436	.666	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG8	.133	.895	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG9	.518	.608	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG10	1.102	.278	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG11	.263	.794	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG12	.463	.647	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG13	.037	.971	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG15	.929	.359	Accept H_0
Ho: There is no significant difference between states and UTs in the performance of SDG16	.531	.599	Accept H_0

Source: Researchers' calculation; ** Calculated at 5 percent level of significance

Table 5.2 depicts the results of the t-test. Results show that for SDG 1, the null hypothesis is rejected (t value 2.036) . Hence, there is a significant difference in the performance of SDGs between states and Union territories. This indicates that, as far as indicators of poverty are concerned, the territorial governance system does show some impact. For SDG 2, i.e, zero hunger (t=1.572), and the difference is not significant. SDG 3 (Good health and well being (t=1.356) and the difference between states and Union Territories is not significant. As far as SDG 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) is concerned, our results show that t = 1.344 and at a 5 percent level of significance, we accept the null hypothesis.

ISSN: 2349-2015
Peer Reviewed & Refereed Journal (IF: 6.74)
Journal Website: www.nrjbe.in

The t value for SDG 5 (achieve gender equality and empower all women and girls) is 1.129, and at 5 percent level of significance, the null hypothesis is accepted, which reflects that there are no significant differences in the performances of States and Union Territories.

For SDG 6 (Ensure availability and sustainable management of water and sanitation for all), the results show that t 1.077 and the null hypothesis is accepted, t value is .436 for SDG 7 (Ensure access to affordable, reliable, sustainable and modern energy for all), and at a 5 percent level of significance, the null hypothesis is accepted. Results of the t-test for SDG 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) show a t value of .133, and at a 5 percent level of significance, the null hypothesis is accepted. Results of SDG 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation) show that there is no significant difference between the states and Union Territories in the performance of SDG 9. (t = .518). For SDG 10, it is found i.e, reduced inequality, the t value is 1.102, and at 5 percent level of significance, the null hypothesis is accepted. Results of SDG 11 (Making cities and human settlements inclusive, safe, resilient, and sustainable) show that at a 5 percent level of significance, there is no significant difference between States and Union Territories with a t value of .236.The null hypothesis is also accepted at a 5 percent level of significance for SDG 12, 13, 15, and 16 with t values of .463, .037, .929, and .531, respectively.

TABLE 5.3 BEST AND WORST PERFORMING STATES AND UNION TERRITORIES FOR EACH SDGs.

SDGs	Best Among States of India	Best Performer Among Union Territories	Poor Performers Among States of India	Poor Performers Among Union Territories
SDG1	Tamil Nadu	Delhi	Bihar	Lakshadweep
SDG2	Kerala	Chandigarh	Jharkhand	Dadra and Nagar Haveli
SDG3	Gujarat	Delhi	Assam	Andaman and Nicobar
SDG4	Kerala	Chandigarh	Bihar	Jammu, Kashmir and Ladakh
SDG5	Chhattisgarh	Andaman and Nicobar	Assam	Delhi
SDG6	Goa	Ladakh	Rajasthan	Delhi
SDG7	Himachal Pradesh Uttarakhand Punjab Uttar Pradesh Sikkim Mizoram Rajasthan Jharkhand Meghalaya Maharashtra Andhra Pradesh Gujarat	Chandigarh Delhi Andaman and Nicobar Jammu and Kashmir Ladakh	Meghalaya	Dadra and Nagar Haveli

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Peer Reviewed & Refereed Journal (IF: 6.74)
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	Telangana Kerala Tamil Nadu Karnataka			
SDG8	Himachal Pradesh	Chandigarh	Manipur	Jammu and Kashmir
SDG9	Gujarat	Delhi	Bihar	Andaman and Nicobar
SDG10	Meghalaya	Chandigarh	Uttar Pradesh	Puducherry
SDG11	Punjab	Chandigarh	Arunachal Pradesh	Lakshadweep
SDG12	Tripura	Jammu and Kashmir	Goa	Delhi
SDG13	Odisha	Andaman and Nicobar	Bihar	Dadra and N agar Haweli
SDG15	Andhra Pradesh	Chandigarh	Rajasthan	Ladakh
SDG16	Uttarakhand	Puducherry	Odisha	Andaman and Nicobar

Source: Prepared by the researchers

V. CONCLUSION

Hence it is clear from the study that the performance of UTs and States are almost at par except SDG 1. Thus, we conclude that territorial governance doesnot have a strong effect on SDG performance.

It is also evident from table 5.3 that within the peer group of regions based, on governance, Chandigarh has performed very well in 7(SDG 2, SDG 4, SDG 7, SDG 8, SDG 10, SDG 11, SDG 15) out of the 14 goals considered among Union Territories, while among the states, Kerela and Gujarat show the best performances in 3-3 goals each. Bihar is a poor performer among states in SDG 1, SDG 4, SDG 9, and SDG 13. Dadra and Nagar Haveli show poor performance in SDG 2, SDG 7, and SDG 13 among the Union Territories.

Though our study did not find any significant difference between states and Union Territiries in most of the SDGs, India's progress toward the 2030 Sustainable Development Goals (SDGs) is uneven across States and Union Territories (UTs). While the national aggregate shows improvement, inter-state variation remains a key challenge for equitable and inclusive development. Addressing this heterogeneity requires a combination of fiscal, institutional, data, and governance reforms tailored to the Indian federal context.

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