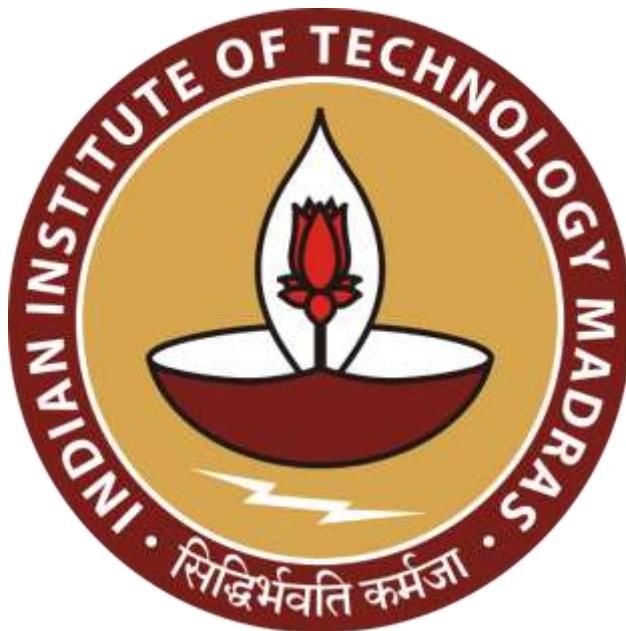

INDUSTRIAL GROWTH IN TELANGANA BACKWARD DISTRICTS.

BDM CAPSTONE PROJECT

FINAL SUBMISSION REPORT - BSMS2001

Submitted by

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Industrial Growth in Telangana Backward Districts

1. Executive Summary

The Industries & Commerce Department is under the control of the General Administration Department, Government of Telangana, Secretariat, Hyderabad. This Department is looking after the Sections like Mines, Handlooms & Textiles, Industrial Establishment - Sugar Industries & Commerce, Export & Promotion, INF & IP (Infrastructure & Industrial Promotion), MSME-FP- Biotech, Vigilance & IFR & Miscellaneous. [Telangana Industries Department](#)

The data source used in the Analysis is collected from the Telangana Government website. The study and Analysis are made on the data sets of Q3 and Q4 of 2024.

The Analysis is done to get more insight into the problems of a lack of industrial growth in a few districts of Telangana. (A) Low exports despite high investments received in some areas. (B) Investment is concentrated in only a few districts. (3 out of 31) (C) Lack of awareness of government incentives.

The Analysis is done on the data about factories operating in Telangana, details regarding industries, and the investments made between June 2024 to December 2024., comprehensive information on MSMEs in the state, and TS-iPASS (Telangana State Industrial Project Approval and Self-Certification System) related data. Additionally, information on various industry incentives provided by the state government is gathered, along with data about the availability of industrial raw materials by District and village.

Data is preprocessed, and the relation between datasets is collected. The Time series analysis was conducted on various data points. Plotted the results on charts to better visualize the insights in the data.

Analysis Methods used are Data Preprocessing, Exploratory data analysis (EDA), Regression analysis, and Time series analysis.

Key findings are that Investments are seen less in the Mega and Medium category industries, Unequal distribution among the districts for investments, and Less to moderate awareness towards incentives in various districts.

Recommendations are that having the investment distributions as depicted below would be advantageous for export improvement. oMicro & Small Enterprises (MSEs): 45-50%, Medium Enterprises (MEs): 30-35%, Mega Industries: 25-30%. Investment in the Medium and Mega industry sectors can yield growth in exports. Govt. should identify the industrial zones across the state and provide promotions with incentives to develop the infrastructure and industries in backward areas. Govt. should launch / campaigns for promoting industrial incentives across all districts and segments.

Industrial Growth in Telangana Backward Districts

2. Proof of Originality

The TS-iPASS is a single-window clearance system for investors in Telangana, simplifying business approvals and promoting ease of doing business.

TS-iPASS provides Incentives to investors on Investment Subsidy, Reimbursement of Stamp Duty, Transfer Duty, Mortgage Duty, Land Conversion charges, Reimbursement of Land Cost purchased in IE / IDA / IE, Reimbursement of Power Tariff, Reimbursement of Interest Subsidy under Pavala Vaddi scheme, Reimbursement of Sales Tax, Grant of seed capital assistance, Reimbursement of certification charges for acquiring quality certification, Reimbursement of cost of equipment purchased for cleaner production measures, Reimbursement of cost involved in skill upgradation and training, Sanction of Industrial Infrastructure fund (IIDF), Advance Subsidy claim for SC, ST & PHC enterprises.

The data for this study were collected from reliable online resources. Primarily, information is sourced from the Telangana Government's Open Data Portal. Data sets used are available at <https://data.telangana.gov.in/search/?page=2&theme=Industries>, and the official website of the Department of Industries & Commerce is <https://industries.telangana.gov.in/organisation.aspx> published this data.

3. Metadata and Descriptive Statistics

The data sets collected and used for Analysis are (1) Telangana Industries Incentives Data, (2) Telangana Industries TS-iPASS Data, (3) Overview of Industries and Investment, (4) Factories in Telangana, (5) Telangana Industries MSME Data, (6) TG-NPDCL & TGSPDCL Industrial consumption data, and (7) Telangana Industries Raw Material data.

(1) This dataset provides information about the Industrial Incentives in Telangana for units set up in the state

The data set contains the below columns: | District | Mandal | Village | Unit_Name | Unit_Address | incentive_name |

(2) This dataset provides information about the TS-iPASS Data in Telangana for units set up in the state

The data set contains the below columns: | district | mandal | village | unit_name | line_of_activity | sector | investment | number_of_employees | application_date | approval_date | progress_of_implementation | in_online | social_status |

(3) This data set provides information about the Industries, Employees in the Industries, and Investment in Crores in each of the districts.

Data contains the following columns: districts, industry_units, employees, investment_rs_crores

(4) This dataset provides information about the Factories present in the state of Telangana.

Industrial Growth in Telangana Backward Districts

Data contains the below columns: NIC Code: National Industrial Classification Code, NIC Division: National Industrial Classification Division, NIC Group: National Industrial Classification Group, District, Mandal, Name of the Factory, H.P (Total Horse Power for the Factory), No of Men, Women, Total working in the factory, Maximum number of Employees, Average Number of Employees.

(5) This dataset provides information about the Micro Small & Medium Enterprises (MSMEs) in Telangana for units set up in the state.

Data contains the below columns: | district | mandal | industry_category | type_of_industry | unit_name | line_of_activity | investment | employment | present_status | export | type_of_connection |

(6) This dataset provides information about the Industrial consumption details in the Northern and Southern parts of Telangana.

Data contains the below columns: | circle | division | subdivision | section | area | catdesc | catcode | totservices | billdservices | units | load |

(7) This dataset provides information about the Industries' Raw Material data in Telangana for units set up in the state

Data contains the below columns: | district | mandal | village | raw_material_type | unit_name | application_filed_date |

Descriptive Statistics

	investment (Crores/ INR)	employment (count)	export_flag	total_units (count)	export_ratio (percentage)
count	25	25	25	25	25
mean	3591.3228	335.92	0.32	10.2	1%
std	3805.177963	737.677997	1.249	10.107753	3%
min	10	5	0	1	0%
25%	400	34	0	2	0%
50%	2209	95	0	7	0%
75%	5805.69	245	0	14	0%
max	12858.87	3671	6	38	16%

Summary.describe()

- From the table, it is shown that the Investment range is between ₹10 to ₹12,858.87 crores
- Standard deviation is ₹3,805.18 crores, indicating a large variance in investment levels
- median is ₹2,209 crores, showing 50% of industries invested below this
- Employment has an average of 336 and a maximum of 3,671. Standard Deviation is 737.68crores, which is twice the mean. As the mean (336) is significantly higher than the median (95). This suggests that it is right-skewed.
- From the export ratio, it is found that most of the industries have zero exports. The median and 75th percentile are both 0. The max export ratio is 15.78% and the mean of the export is less than 1%.

Industrial Growth in Telangana Backward Districts

- The export_flag tells whether an industrial unit is involved in exports. From the export flag, also median and 75th percentile are both 0. The Maximum value is 6.
- The total_units feature represents the number of industrial units. Total Units range from 1 to 38, with a median of 7 and an average of 10.2, and the Standard Deviation is 10.11. This implies that most of the districts have fewer than 10 industrial units.

4. Detailed Explanation of Analysis Process/Method

To analyze the data on industrial development and initiatives, a methodical approach is adopted by calculating statistics and creating metrics to gain insights into the various districts for lines of business, initiatives received, and exports.

The following methods are employed in the data analysis to identify districts with low exports, low investments, and gaps in incentive allotments.

1. Data Preprocessing:

- a. I cleaned the dataset using the box plot method to identify the outliers and removed them.
- b. Removing the missing values (& NaN): using the dropna function for removing the invalid numerical values.
- c. Using the Pandas Library, combined the data sets for 7 months of MSME datasets and incentives datasets.

```
Import pandas as pd

files = ["ts_industry_msme_june2024.csv", "ts_industry_msme_july2024.csv",
"ts_industry_msme_aug2024.csv", "ts_industry_msme_sep2024.csv",
"ts_industry_msme_oct2024.csv", "ts_industry_msme_nov2024.csv", "ts_industry_msme_dec2024.csv"]

df_list = [pd.read_csv(file) for file in files]
combined_msme = pd.concat(df_list, ignore_index=True)

combined_msme.columns = [col.strip().lower().replace(" ", "_") for col in combined_msme.columns]
combined_msme.head()
```

- d. Using the GroupBy Function (Pandas) to know the sum of the Investment, export flag, and total units.

```
summary = msme_summ.groupby('district_name').agg({
'investment':'sum',
'employment':'sum',
'export_flag':'sum',
'unit_name':'count'
}).reset_index().rename(columns={'unit_name': 'total_units'})

summary['export_ratio'] = summary['export_flag']/summary['total_units'] *100
summary
```

- e. Used the GroupBy Function (Pandas) to combine multiple parameters for the Analysis. The GroupBy function is used to group various columns to extract the results.

```
inv_by_category = msme_summ.groupby(["district_name", "industry_category"])["investment"].sum().unstack(fill_value=0).reset_index()
```

Industrial Category

Industrial Growth in Telangana Backward Districts

district_name	MEDIUM	MEGA	MICRO	SMALL
Adilabad	0	0	10	0
Bhadradri Kothagudem	0	0	50	2879
Bhupalpally	0	0	0	95
Gadwal	0	0	0	118.58
Hanumakonda	0	35	1294.65	4476.04
Hyderabad	0	0	0	24
Jagtial	0	0	1295	405
Jangaon	0	0	15	1319
Karimnagar	0	0	426.24	6885
Khammam	0	0	1383	582
Mahbubnagar	0	0	0	2209
Medak	0	0	1412.65	2504.43
Medchal	3235	0	2543	7080.87
Nagarkurnool	0	0	0	345.9
Nalgonda	664	0	1115	1568
Nirmal	0	0	220	1270
Peddapalli	0	0	0	400
Rangareddy	450	0	1032.12	7659.4
Sangareddy	1094	300.02	2370	8698.3
Siddipet	0	0	0	7152.08
Sircilla	0	0	3496.73	2155
Vikarabad	0	0	331	538
Wanaparthy	0	0	400	2126.5
Warangal	0	0	0	15
Yadadri	800	0	0	5304.56

2. Using Matplotlib and Seaborn libraries to plot the Bar charts, Stack Bar charts, Regression, and Time Series analysis.
3. I used the Describe function, Information function, and Plotted Charts.
4. Regression analysis is used to identify the relationships between dependent and independent variables. In the Analysis, “Investment” is an independent variable, and “Export Ratio” is a dependent variable.
5. Using linear regression, I determined the slope, intercept, R² score, and correlation to understand the relationship between Investment and exports in the districts of Telangana.
6. Time series analysis is used to analyse the data collected over the period. Using time series analysis, I have analyzed the 7 months of data to identify the monthly Investment in the top 3 districts of Telangana and the awareness of incentives for various months in all districts.

Methods used in Analysis:

- Analysing the observation on Lower exports despite high investments in some areas.

Industrial Growth in Telangana Backward Districts

- After data preprocessing, I conducted an exploratory analysis on 7 months of TS MSME (Industries) data and plotted a mixed plot of district-wise investment and export Ratios to understand the relationship between Investment and export ratios.
 - This visualization helped me compare districts that have high investments but a low export Ratio.
 - Plotted regression analysis to determine whether high investments lead to a high export ratio.
 - After that, I made a comparison using industry category, which consists of Small, Medium, Mega, and Micro industries.
- Analysing the observation on Investment concentrated in a few districts.
 - I used Time series analysis, taking each month's data points, and compared the month vs investments (Cr.) to find the top 3 districts getting a higher concentration of Investment. These districts are Madchal, Ranga Reddy, and Sangareddy.
 - These 3 districts received the highest investments compared to other districts. An unequal distribution of Investment has been observed throughout this Analysis.
 - Analysing the observation of the Lack of awareness of government incentives
 - I merged the TS incentive dataset and the TS MSME dataset to know which MSME units have received the incentives and which have not.
 - I plotted time series analysis to know the incentive awareness (month Vs incentive usage). Identified the districts that have received the incentives and those that have not received the incentives.

5. Results and Findings

The Analysis is conducted on the data period of 7 months (June 2024 to December 2024).

District-wise Export Ratio: Calculated by the total number of **units set up in the District vs the units of export-oriented** industries that have Investment during the study period. It helps in knowing the export ratio percentage for each District. From this, we can conclude that only Medchal and Sangareddy have exports. The remaining districts have zero exports.

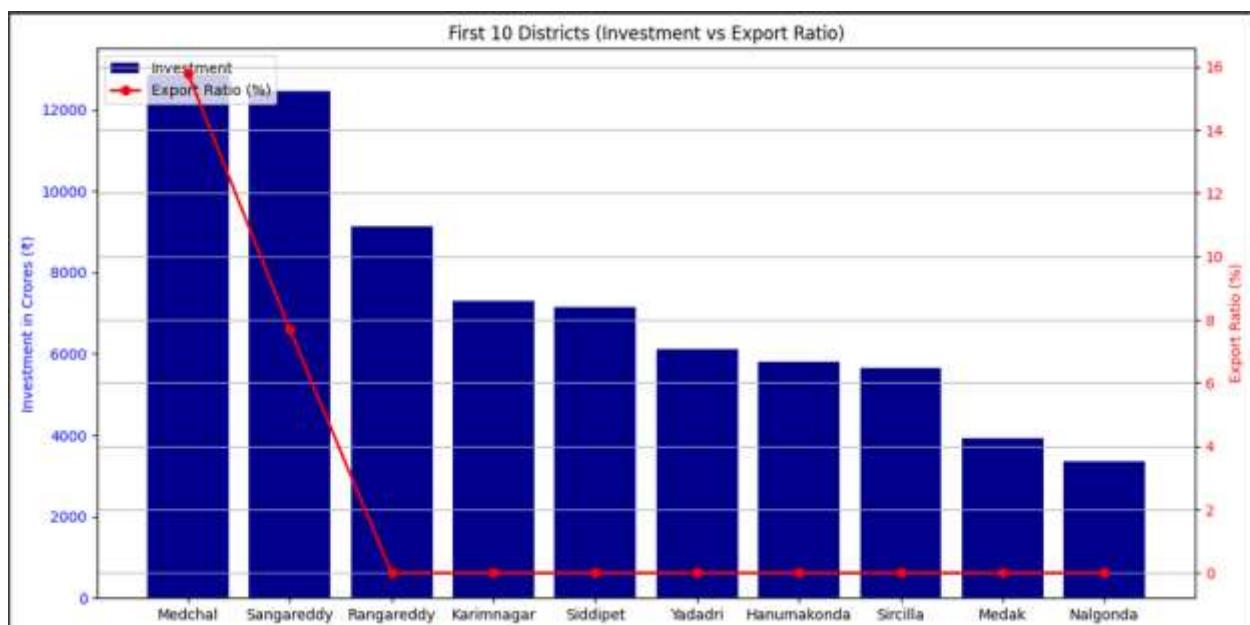
district_name	investment	employment	export_flag	total_units	export_ratio
Adilabad	10	5	0	1	0
Bhadradri Kothagudem	2929	73	0	5	0
Bhupalpally	95	15	0	1	0
Gadwal	118.58	20	0	1	0
Hanumakonda	5805.69	241	0	23	0
Hyderabad	24	15	0	1	0
Jagtial	1700	55	0	4	0
Jangaon	1334	95	0	6	0
Karimnagar	7311.24	370	0	26	0
Khammam	1965	84	0	7	0
Mahbubnagar	2209	141	0	6	0
Medak	3917.08	245	0	11	0

Industrial Growth in Telangana Backward Districts

Medchal	12858.87	994	6	38	15.789474
Nagarkurnool	345.9	16	0	2	0
Nalgonda	3347	135	0	10	0
Nirmal	1490	79	0	7	0
Peddapalli	400	50	0	1	0
Rangareddy	9141.52	779	0	25	0
Sangareddy	12462.32	3671	2	26	7.692308
Siddipet	7152.08	396	0	12	0
Sircilla	5651.73	231	0	14	0
Vikarabad	869	34	0	4	0
Wanaparthy	2526.5	149	0	7	0
Warangal	15	6	0	1	0
Yadadri	6104.56	499	0	16	0

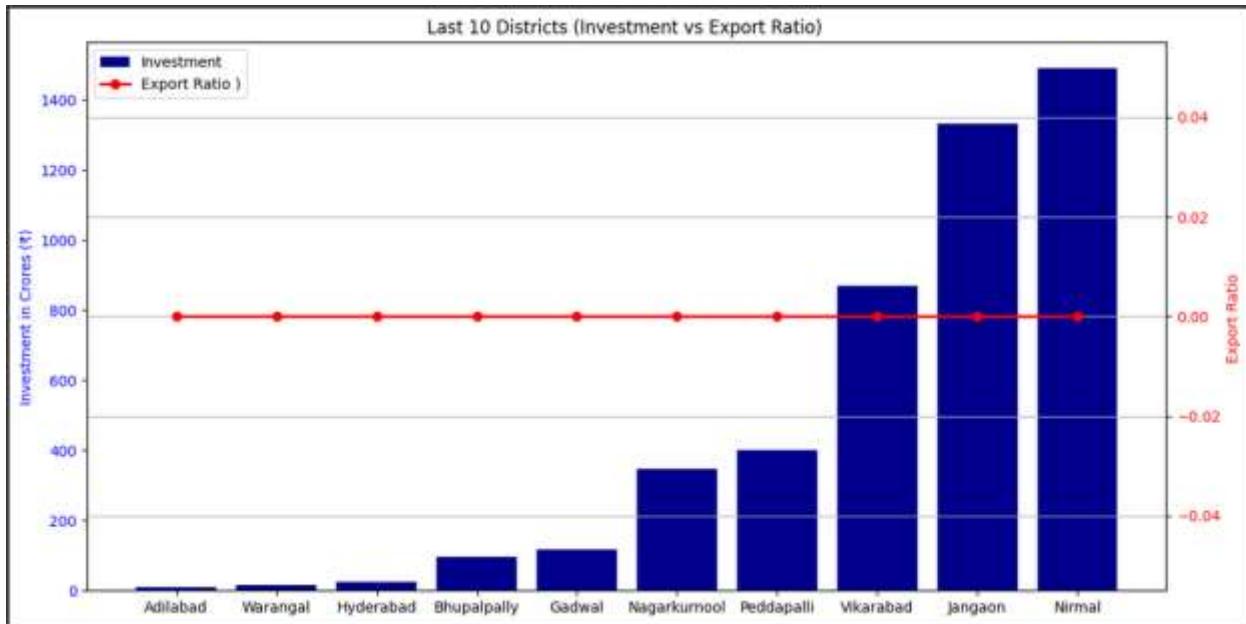
It is further presented in a chart to provide unified and improved visibility of the metrics. The results are in crores.

The **Combination Chart** is plotted below.



In combination chart shows us a comparison between Investment and export ratios of the first 10 districts. This representation gives a clear idea of how exports vary between different districts. Apart from 2 districts remaining have zero exports despite high investments.

Industrial Growth in Telangana Backward Districts



This chart represents the last 10 districts having low investments with low exports. According to the chart, no district has exports. Additionally, Adilabad, Hyderabad, and Warangal are receiving low investments compared to the remaining districts.

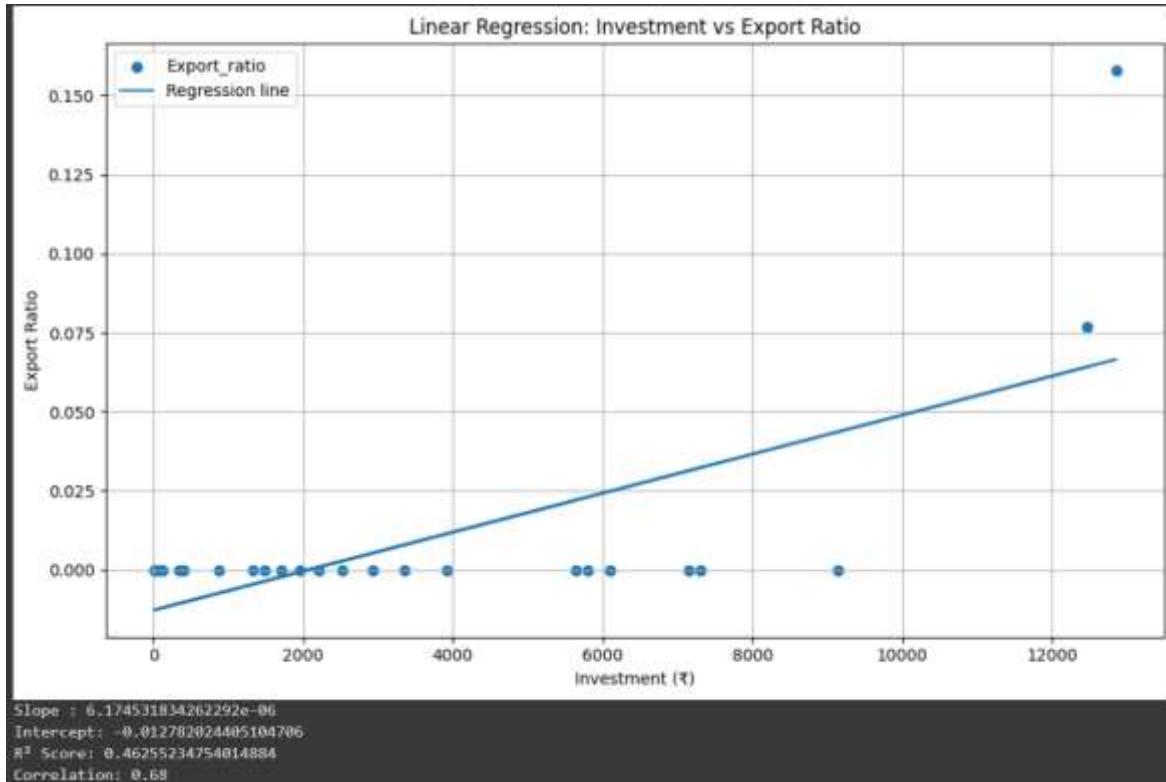
Regression Analysis: Regression analysis is a statistical method used to estimate the relationships between a dependent variable and one or more independent variables

Regression analysis was performed to plot the relationship between Investment and export ratio. The blue line is the **regression line** is straight.

- Dependent Variable (Y): Export Ratio
- Independent Variable (X): Investment (₹)

It indicates that with an increase in Investment, the export ratio also increases. **Correlation (0.68)** Indicates a moderately strong positive correlation between Investment and export ratio. But it contradicts our point despite high Investment and low exports. Even from the plot, there are 2 outliers. So regression is not a suitable analysis here. Further Analysis is required to find out the reason for the low exports.

Industrial Growth in Telangana Backward Districts



Summarizing by unit setup by Industrial category: The total industries by category [as Medium, Mega, Micro, and Small] are summarized across the state. This is designed to identify the number of industries established in various Industrial categories during the study period. This table tells us that industry is divided into four categories: medium, mega, micro, and small. This table displays the district-wise distribution of industry categories.

industry_category				
district_name	MEDIUM	MEGA	MICRO	SMALL
Adilabad	0	0	1	0
Bhadradri Kothagudem	0	0	1	4
Bhupalpally	0	0	0	1
Gadwal	0	0	0	1
Hanumakonda	0	1	6	16
Hyderabad	0	0	0	1
Jagtial	0	0	3	1
Jangaon	0	0	1	5
Karimnagar	0	0	2	24
Khammam	0	0	3	4
Mahbubnagar	0	0	0	6
Medak	0	0	6	5
Medchal	4	0	10	24

Industrial Growth in Telangana Backward Districts

Nagarkurnool	0	0	0	2
Nalgonda	2	0	4	4
Nirmal	0	0	1	6
Peddapalli	0	0	0	1
Rangareddy	1	0	4	20
Sangareddy	2	1	5	18
Siddipet	0	0	0	12
Sircilla	0	0	8	6
Vikarabad	0	0	2	2
Wanaparthy	0	0	1	6
Warangal	0	0	0	1
Yadadri	1	0	0	15

Summarizing by Investment received by the Industrial category: The total Investment received by the industrial category [as Medium, Mega, Micro, and Small] is summarized across the state. This is done to identify the investments received in various Industrial categories. Now, as the table shows district-wise, each industry category. It also tells how much Investment each industry category receives

district_name	MEDIUM	MEGA	MICRO	SMALL
Adilabad	0	0	10	0
Bhadradri Kothagudem	0	0	50	2879
Bhupalpally	0	0	0	95
Gadwal	0	0	0	118.58
Hanumakonda	0	35	1294.7	4476
Hyderabad	0	0	0	24
Jagtial	0	0	1295	405
Jangaon	0	0	15	1319
Karimnagar	0	0	426.24	6885
Khammam	0	0	1383	582
Mahbubnagar	0	0	0	2209
Medak	0	0	1412.7	2504.4
Medchal	3235	0	2543	7080.9
Nagarkurnool	0	0	0	345.9
Nalgonda	664	0	1115	1568
Nirmal	0	0	220	1270
Peddapalli	0	0	0	400
Rangareddy	450	0	1032.1	7659.4
Sangareddy	1094	300	2370	8698.3
Siddipet	0	0	0	7152.1
Sircilla	0	0	3496.7	2155
Vikarabad	0	0	331	538
Wanaparthy	0	0	400	2126.5

Industrial Growth in Telangana Backward Districts

Warangal	0	0	0	15
Yadadri	800	0	0	5304.6

Analyze the Districts with high Investment and low export ratio: The total Investment received by industrial category [as Medium, Mega, Micro, and Small] is summarized across the state. This is done to identify the investments received in various Industrial categories. This table helps us to know the districts with high investments and low exports. districts are Rangareddy, Karimnagar, Siddipet, etc

district_name	investment	export_ratio
Rangareddy	9141.52	0
Karimnagar	7311.24	0
Siddipet	7152.08	0
Yadadri	6104.56	0
Hanumakonda	5805.69	0
Sircilla	5651.73	0
Medak	3917.08	0
Nalgonda	3347	0

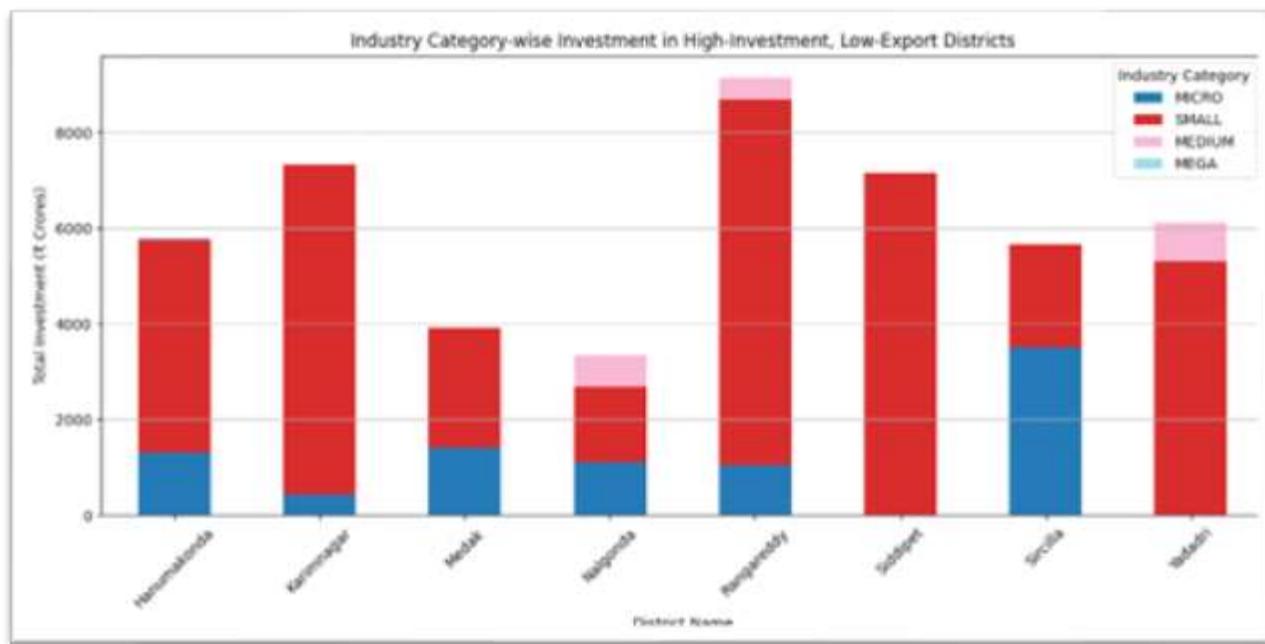
industry_category	MEDIUM	MEGA	MICRO	SMALL
district_name				
Hanumakonda	0	1	6	16
Karimnagar	0	0	2	24
Medak	0	0	6	5
Nalgonda	2	0	4	4
Rangareddy	1	0	4	20
Siddipet	0	0	0	12
Sircilla	0	0	8	6
Yadadri	1	0	0	15

This table shows the industry categories (medium, mega, micro, small) of districts with high investment and low export ratios, district-wise.

district_name	industry_category			
	MEDIUM	MEGA	MICRO	SMALL
Hanumakonda	0	35	1294.7	4476
Karimnagar	0	0	426.24	6885
Medak	0	0	1412.7	2504.4
Nalgonda	664	0	1115	1568
Rangareddy	450	0	1032.1	7659.4
Siddipet	0	0	0	7152.1
Sircilla	0	0	3496.7	2155
Yadadri	800	0	0	5304.6

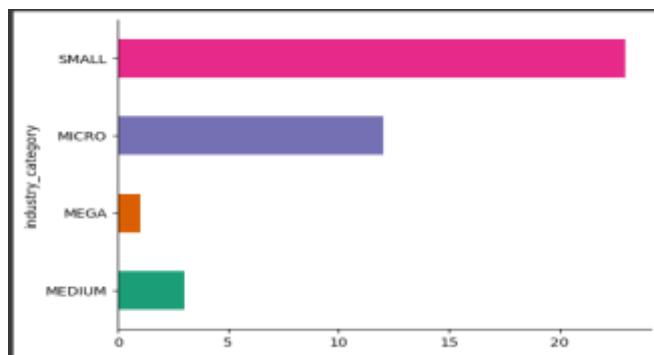
Industrial Growth in Telangana Backward Districts

The same Analysis is plotted in a chart.



The **stacked bar plot** shows district-wise industry category distribution plotted from the above table. Each bar is stacked, which means the total height of the bar represents cumulative Investment, and each colored section shows how much of that Investment came from each industry category.

This stacked bar plot helps us to understand **ownership forms** like Partnership, LLP, and Proprietary in each District. How different ownership types contribute to total Investment.



The barplot is drawn to determine which industry category has the most industries. The small,micro-scale industries account for 80% of the overall industries. Due to more concentration on small, micro-scale industries and less Investment in mega, medium has resulted in low exports despite high Investment in many districts. As mega and medium have a focus on the export market. Investments should be properly distributed among small, micro, medium, and mega enterprises for good market flow.

Industrial Growth in Telangana Backward Districts

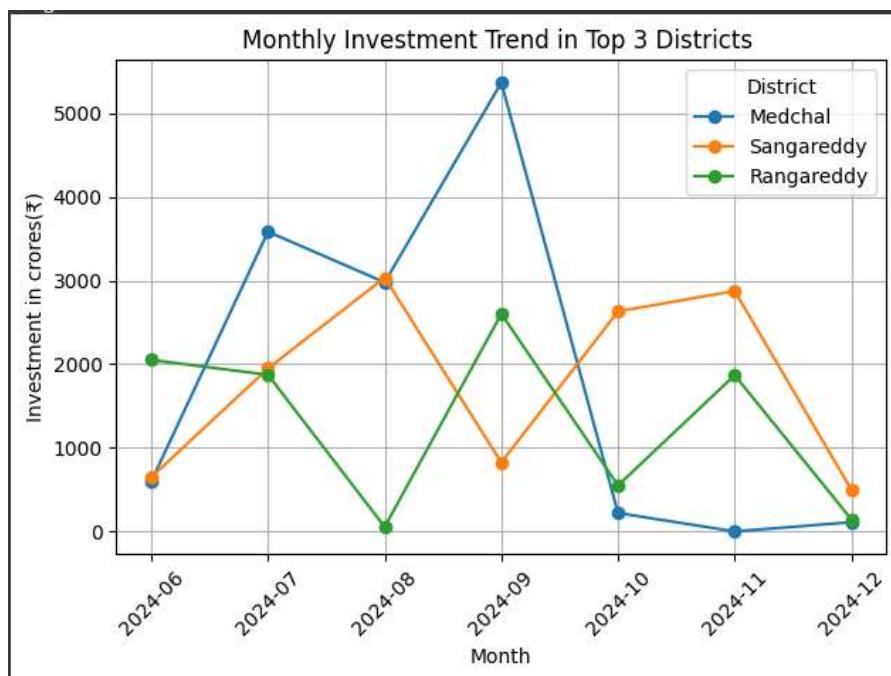
The Analysis done so far is to get insight into the problem “Low exports despite high investments received in some areas”.

The further Analysis primarily focused on Investments concentrated in a few districts.

Time series analysis

Time series analysis is used to analyze data collected over an interval of time to identify trends, patterns, etc.

Line Chart of Monthly Investment Trends



The time series analysis shows the three districts, Medchal, Sangareddy, and Rangareddy monthly investments. From this, Medchal accounts highest Investment, followed by Sangareddy and Rangareddy districts.

Year-month	total_investment	top3_investment	top3_share_pct
2024-06	11254.85	3300.45	29.324691
2024-07	17742.4	7404.72	41.734602
2024-08	14301.77	6066.62	42.418666
2024-09	16951.83	8791.71	51.862896
2024-10	7819.42	3401.6	43.501948
2024-11	13605.62	4742	34.853244
2024-12	8107.18	755.61	9.320257

The Analysis highlights the fact that the top 3 investment-receiving districts account for more than 35% of the total Investment across the 33 districts. The total investment share received by month is presented and compared to the total Investment received in all 33 districts vs the top 3 districts that received the Investment.

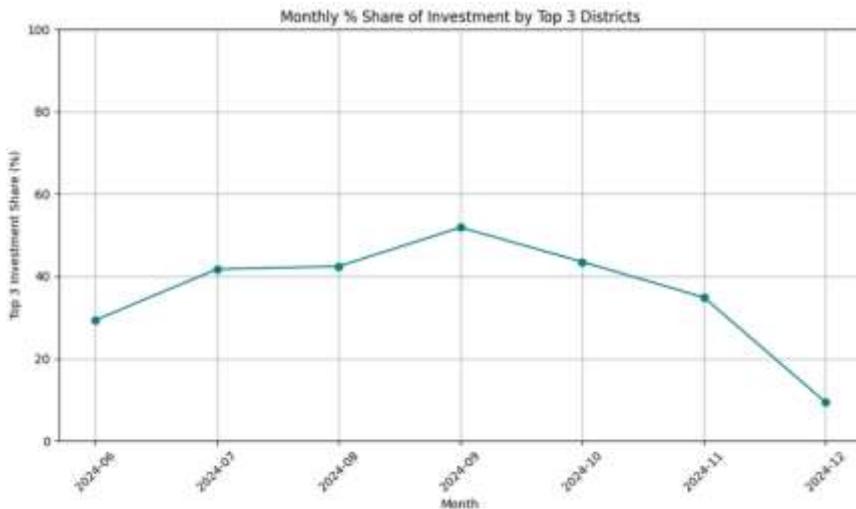
Industrial Growth in Telangana Backward Districts

The data is analysed to identify the investment percentage by District. Each District's percentage is given along with its overall Investment. Medchal has the highest, with 12858.87 (in cr), and 14.32 accounts for the District. Adilabad has the lowest 10 crore, accounting for just 0.01%.

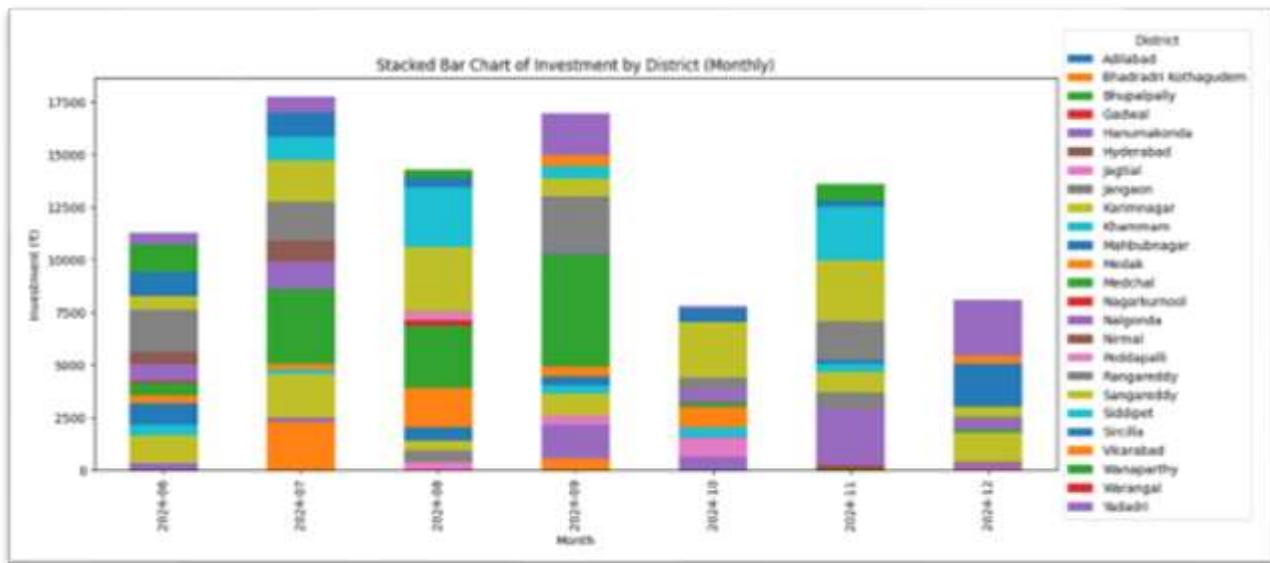
district_name	Investment(in cr)	investment_pc
Medchal	12858.87	14.32
Sangareddy	12462.32	13.88
Rangareddy	9141.52	10.18
Karimnagar	7311.24	8.14
Siddipet	7152.08	7.97
Yadadri	6104.56	6.8
Hanumakonda	5805.69	6.47
Sircilla	5651.73	6.29
Medak	3917.08	4.36
Nalgonda	3347	3.73
Bhadradri Kothagudem	2929	3.26
Wanaparthy	2526.5	2.81
Mahbubnagar	2209	2.46
Khammam	1965	2.19
Jagtial	1700	1.89
Nirmal	1490	1.66
Jangaon	1334	1.49
Vikarabad	869	0.97
Peddapalli	400	0.45
Nagarkurnool	345.9	0.39
Gadwal	118.58	0.13
Bhupalpally	95	0.11
Hyderabad	24	0.03
Warangal	15	0.02
Adilabad	10	0.01

The chart below shows the percentage (%) of Investment from the top 3 districts. (**time series analysis**)

Industrial Growth in Telangana Backward Districts



The chart below shows the **Stacked Bar** of Investment by District (Monthly)



This stacked bar plot shows the monthly investment distribution among all districts. District-wise Investment in a particular month helps us identify which districts are receiving higher and lower investments.

Industrial Growth in Telangana Backward Districts

Month ➔	2024-06	2024-07	2024-08	2024-09	2024-10	2024-11	2024-12	Total	investment_pct(%)
district_name									
Adilabad	10	0	0	0	0	0	0	10	0.01
Bhadradri Kothagudem	0	2307	0	572	0	0	50	2929	3.26
Bhupalpally	0	0	0	0	0	95	0	95	0.11
Gadwal	0	0	0	0	0	118.58	0	118.58	0.13
Hanumakonda	319	215	0	1604	640.65	2727	300	5805.7	6.47
Hyderabad	0	0	0	0	0	0	24	24	0.03
Jagtial	0	0	400	405	895	0	0	1700	1.89
Jangaon	0	0	531	0	36	767	0	1334	1.49
Karimnagar	1348	2070	450	1077.2	0	936	1430	7311.2	8.14
Khammam	488	208	0	374	473	422	0	1965	2.19
Mahbubnagar	1000	0	657	400	0	152	0	2209	2.46
Medak	398	236	1842.7	490	950.43	0	0	3917.1	4.36
Nagarkurnool	95.9	0	250	0	0	0	0	345.9	0.39
Nalgonda	800	1295	0	140	640	0	472	3347	3.73
Nirmal	520	970	0	0	0	0	0	1490	1.66
Peddapalli	0	0	400	0	0	0	0	400	0.45
Siddipet	0	1135.5	2854.5	614.08	0	2548	0	7152.1	7.97
Sircilla	1120	1141	450	0	632.74	300	2008	5651.7	6.29
Vikarabad	0	0	0	470	0	0	399	869	0.97
Wanaparthy	1328.5	0	400	0	0	798	0	2526.5	2.81
Warangal	15	0	0	0	0	0	0	15	0.02
Yadadri	512	760.18	0	2013.8	150	0	2668.6	6104.6	6.8

The results show that some districts, like Warangal, Hyderabad, and Adilabad, recorded negligible Investment compared to other districts. It is observed that districts like Yadadri, Sircilla, Siddipet, Karimnagar, and Hanumakonda received consistent investments throughout the month.

The Analysis done so far is to get insight into the problem “Investment concentrated in only a few districts”.

The further Analysis primarily focused on drawing some information on “Lack of awareness of government incentives”.

The data on incentives received for various units across the state.

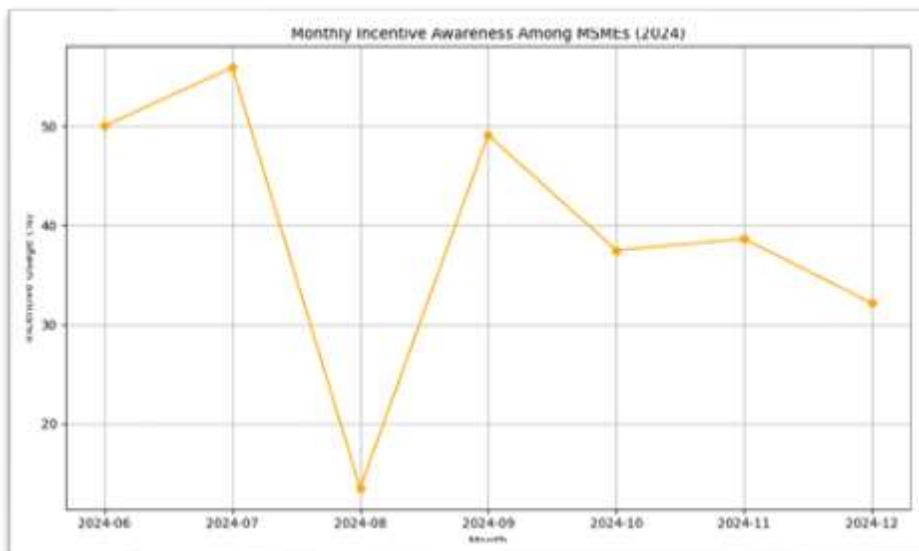
district	mandal	village	unitname	unitaddress	incentive_name	month
Adilabad	ADILABAD (URBAN)	Bhukthapur	hanvate sumedh bhodi	H. NO. 2-2-354 Bhukthapur ADILABAD (URBAN) Adi...	Investment Subsidy	2024-06
Adilabad	Bela	Pohar	ade laxmi bai	H.NO.4-38/1 Pohar Bela Adilabad	Investment Subsidy	2024-06
Adilabad	Jainad	Kura	sidam shankar	H.NO.2-250 Kura Jainad Adilabad	Investment Subsidy	2024-06
Asifabad	Asifabad	Appepalle	kotnaka shankar	HNO 1-64/1 Appepalle Asifabad Asifabad	Investment Subsidy	2024-06
Asifabad	Kouthala	Kouthala	mr Mr. Durgam janaki rao	HNO 2-34 Kouthala Kouthala Asifabad	Investment Subsidy	2024-06

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unit_name	ie_or_not	industry_category	district_name	mandal_name	employment	line_of_activity	investment	present_status	typeofindustry	export	typeofconnection	month
Adilabad Aqua water plant	NO	MICRO	Adilabad	MAVAL A (NEW)	5	Mineralized water	10	Working	Proprietary	No	LT	2024-06
M/s HARIKA PYRO - PROD UCTS	YES	MEGA	Hanumakonda	Khaazipet	8	Tyres and tubes vulcanization/ hot retreating	35	Working	Partnership	No	LT	2024-06
SV Exports	YES	SMALL	Hanumakonda	Khaazipet	10	Granite / Stone Cutting and Polishing	284	Working	Partnership	No	LT	2024-06
NAKSHATRA GRANITES AND EXPORTS	NO	SMALL	Karimnagar	Gangadara	15	Cutting, sizing, and polishing of marble stone	302	Working	Partnership	No	HT	2024-06
SRI VAISHNAVI INDUSTRIES	NO	SMALL	Karimnagar	Gangadara	15	Granite / Stone Cutting and Polishing	190	Working	Partnership	No	LT	2024-06

Note: This picture shows only five districts

The summary presented below illustrates the awareness of incentives across units established in various months. (**time series analysis**).



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A time series is plotted to show the monthly incentives usage among the districts. We can view the awareness percentage in different months.

	month	total_units	got_incentive	awareness_pct
0	2024-06	44	22	50.000000
1	2024-07	59	33	55.932203
2	2024-08	37	5	13.513514
3	2024-09	55	27	49.090909
4	2024-10	32	12	37.500000
5	2024-11	44	17	38.636364
6	2024-12	28	9	32.142857

The incentive pattern shows that overall incentive awareness among districts is very low. Month-wise, July represents the highest percentage in awareness. August showed very little compared to the remaining months. Monthly-wise, overall awareness is less than 60%.

Analysis is done to calculate the incentive percentage across the districts. The table presents district-wise incentives in each District. The table shows the count of incentives by District, along with their overall percentage contribution.

district	incentive_count	incentive_pct
Adilabad	30	0.43
Asifabad	45	0.64
Bhadradri Kothagudem	98	1.39
Bhupalpally	46	0.65
Gadwal	59	0.84
Hanumakonda	118	1.67
Hyderabad	152	2.15
Jagtial	81	1.15
Jangaon	71	1.01
Kamareddy	125	1.77
Karimnagar	489	6.93
Khammam	241	3.42
Mahabubabad	206	2.92
Mahbubnagar	264	3.74
Mancherial	108	1.53
Medak	246	3.49
Medchal	523	7.41
Mulugu	32	0.45
Nagarkurnool	290	4.11
Nalgonda	553	7.84
Narayanpet	122	1.73
Nirmal	67	0.95
Nizamabad	130	1.84
Peddapalli	50	0.71
Rangareddy	859	12.18
Sangareddy	380	5.39

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Siddipet	179	2.54
Sircilla	145	2.06
Suryapet	495	7.02
Vikarabad	253	3.59
Wanaparthy	207	2.93
Warangal	171	2.42
Yadadri	219	3.1

Analysis is conducted to examine the incentives received by each incentive type.

unit_name	district_name	incentive_name
sri srinivasa sai associates	Bhadradri Kothagudem	Investment Subsidy
sahasra converters	Bhadradri Kothagudem	Investment Subsidy
abhinav consultancy	Bhadradri Kothagudem	Advance Subsidy before DCP for SC/ST Enterprises
sri srinivasa sai associates	Bhadradri Kothagudem	Reimbursement of stamp Duty/Transfer Duty
raghavendra irrigations	Gadwal	Investment Subsidy
...
pranav enterprises	Yadadri	Investment Subsidy
pranav enterprises	Yadadri	Power Cost Reimbursement
pranav enterprises	Yadadri	Reimbursement of Mortgage
pranav enterprises	Yadadri	Pavalla vaddi
m/s. sharada mechanical engineering unit-ii	Yadadri	Reimbursement of stamp Duty/Transfer Duty

The data is analyzed to find the districts with at least one MSME unit that has received an incentive.

Districts that received at least 1 MSME incentive:

['Bhadradri Kothagudem', 'Gadwal', 'Hanumakonda', 'Jagtial', 'Karimnagar', 'Khammam', 'Mahbubnagar', 'Medak', 'Medchal', 'Nagarkurnool', 'Nalgonda', 'Nirmal', 'Rangareddy', 'Sangareddy', 'Siddipet', 'Sircilla', 'Vikarabad', 'Wanaparthy', 'Yadadri']

The data is analyzed to find the districts with no MSME units that received an incentive.

Districts with MSMEs but no incentives received:

['Adilabad', 'Bhupalpally', 'Hyderabad', 'Jangaon', 'Peddapalli', 'Suryapet', 'Warangal']

Filtered the data to highlight the districts that have applied for/received incentives.

```
Total districts in MSME data: 26
Districts that received incentives: 19
Districts with no incentives: 7
```

The data was aggregated to visualize the incentives received by the District and the percentage of units that received incentives.

Industrial Growth in Telangana Backward Districts

district_name	total_msme	got_incentives	incentive_pct
Medchal	44	13	29.545455
Sangareddy	35	13	37.142857
Rangareddy	30	14	46.666667
Karimnagar	26	20	76.923077
Hanumakonda	25	11	44.000000
Siddipet	18	3	16.666667
Yadadri	17	11	64.705882
Sircilla	15	7	46.666667
Medak	15	4	26.666667
Nalgonda	11	3	27.272727
Wanaparthy	7	3	42.857143
Vikarabad	7	3	42.857143
Nirmal	7	6	85.714286
Khammam	7	4	57.142857
Jangaon	6	0	0.000000
Jagtial	6	2	33.333333
Mahbubnagar	6	1	16.666667
Bhadradri Kothagudem	5	4	80.000000
Nagarkurnool	3	2	66.666667
Peddapalli	2	0	0.000000
Hyderabad	2	0	0.000000
Adilabad	1	0	0.000000
Gadwal	1	1	100.000000
Bhupalpally	1	0	0.000000
Suryapet	1	0	0.000000
Warangal	1	0	0.000000

This table shows the total number of MSMEs in each District and the number of MSMEs that have incentives. The relative percentage is also calculated to determine the level of incentive awareness in each District. From the table, it is evident that a few districts, such as Suryapet and Warangal, have not taken any incentives, despite receiving benefits and incentives provided by the government. So awareness of incentives is relatively low among many districts. Karminagar and Bhadradi Kothagudem have received the most incentives and have high incentive percentages.

6. Interpretation of Results and Recommendations

A. Lower exports despite high investments in some areas.

- a. The combined chart, which plots Investment and export ratios, shows the districts with low exports.
- b. From the regression Analysis, most of the exports are observed to be zero. Only two districts (Madchal and Sanga Reddy have about 15% and 7.89% of the export Ratio. The regressing model is linear.
- c. R² score is 46% and the correlation is 0.68. It showed a moderately positive linear relationship. This suggests the model does not clearly explain the relationship between Investment and export.
- d. Upon further Analysis, the investment category helped identify the cause of lower exports, despite investments in certain districts.
- e. Most of the investments are directed towards small or micro industries. Very little Investment is going to the Medium and Mega industries.
- f. Small and Micro industries are contracted towards local markets, and they do not focus on export-oriented business.
- g. Medium and Mega industries have a larger focus on exports. Investments should also be concentrated on mega and medium-sized industries. Since mega and medium industries will mainly concentrate on export markets.

Industrial Growth in Telangana Backward Districts

- h. Districts like Ranga Reddy, Karimnagar, and Siddipet have low exports despite high investments due to less concentration on medium and Mega industries.

Recommendations

- Between June and December 2024, Ranga Reddy received an investment of ₹9,141 crore. If the investments were made in the Mega and Medium industries, the exports would have improved.
- The Investments should be encouraged in all 4 categories of industries.
- Following the investment distributions as depicted below would be advantageous for export improvement.
 - o Micro & Small Enterprises (MSEs): 45-50%
 - o Medium Enterprises (MEs): 30-35%
 - o Mega Industries: 25-30%

B. Investment is concentrated in a few districts.

- a. As Ranga Reddy, Sanga Reddy, and Medchal districts are receiving more investments compared to other districts in the State of Telangana.
- b. This led to unequal distribution of Investment.
- c. In Sept 2024, out of 16951 Cr. These 3 districts received 8791 Cr. Which is 51% percent of the total Investment received.
- d. Districts like Adilabad, Warangal, Bhupalpally, and Hyderabad have received less than ₹ 100 crore of Investment in 7 months.
- e. Even in the remaining months, these 3 districts constituted higher investments compared to other districts.
- f. Due to uneven distribution of investments, leading to lower exports in certain districts.
- g. Compared to all districts, Adilabad, Warangal, etc, have low Investment compared to the remaining districts, just Rs 10-15 (cr), so this unequal distribution is affecting the export production market in the state.
- h. 25% of districts investment receipt amount to less than 1% of total investments

Recommendations

- Equal investments should be encouraged in all districts by providing the necessary benefits to backward districts.
- Investors in districts like Adilabad, Warangal, Bhupalpally, and Hyderabad should be encouraged, as investments are currently on the lower side.
- If all districts receive an equal distribution of investments, employment will also be improved across the state.
- Investment in the Medium and Mega industry sectors can yield growth in exports. The government should identify industrial zones across the state and provide promotions with incentives to develop infrastructure and industries in backward areas.
- The government should provide a roadmap and encouragement to industries to transform small sectors into medium and medium-sized sectors into mega sectors.
- The government should establish special export industrial zones to encourage industries in districts like Adilabad, Warangal, and Bhupalpally, among others.

Industrial Growth in Telangana Backward Districts

C. Lack of awareness of government incentives.

- a. The awareness percentage of incentives is found to be 41%.
 - b. Out of 299 MSMEs, only 125 MSMEs received incentives.
 - c. This shows that awareness of the incentives for the MSMEs is less than 50%.
- D. Districts which received incentives for MSME: ['Bhadradri Kothagudem', 'Gadwal', 'Hanumakonda', 'Jagtial', 'Karimnagar', 'Khammam', 'Mahbubnagar', 'Medak', 'Medchal', 'Nagarkurnool', 'Nalgonda', 'Nirmal', 'Rangareddy', 'Sangareddy', 'Siddipet', 'Sircilla', 'Vikarabad', 'Wanaparthy', 'Yadadri']
- E. Districts which did not receive incentives for MSME: ['Adilabad', 'Bhupalpally', 'Hyderabad', 'Jangaon', 'Peddapalli', 'Suryapet', 'Warangal']
- F. The Stacked Bar of Investment by District shows that investments are not consistent across the districts.

Recommendations

- The government should launch campaigns to promote industrial incentives across all districts and segments.
- Focus on districts that do not have awareness of the incentive programs.
- The government should provide more incentives and loans for mega industries to promote the export business.
- Adilabad has low incentives as per the Analysis. More awareness programs are to be conducted in this District, along with encouraging investors to increase their Investment to enhance its export productivity.