

Assessment of tourist's arrivals and their relationship with rainfall: A case study of Tamil Nadu.

R.Vimala¹, B.Mahalingam^{2*} and P.Sujatha³

¹Department of Geography, Presidency College, Chennai, India.

²Centre for Geoinformatics Technology, Department of Geography, University of Mysore, Mysore, India.

³Bharathi Women's College, Chennai, India.

*Corresponding Author's Email: mahabose@gmail.com

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ABSTRACT

The present study has been conducted to assess the tourism arrivals of Tamil Nadu and the relation of rainfall with the tourism arrivals. The study has been done based on the secondary data which have been collected from the concern department. The temporal variation of foreign and domestic tourist arrivals has been calculated using the statistical analysis. The result of temporal variation of tourists shows that, the trend of tourist arrivals into Tamil Nadu have positive growth and the relationship between rainfall and tourist indicate the positive correlation

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Introduction:

Tourism is one of the fastest growing industries in Tamil Nadu, which increases foreign exchanges and creates new employments. The survey conducted by United Nation's World Tourism Organization in 2011-12 states that, tourism has the capacity to create large scale employment directly and indirectly, for diverse sections in society, from the most specialized to unskilled workforce. It provides 6-7 per cent of the world's total jobs directly and millions more indirectly through the multiplier effect. The state Tamil Nadu is a multi-dimensional tourism spot for the tourist, according to the Tamil Nadu policy report 2013-2014, the state is famous for temple towns, historical monuments, wildlife and bird sanctuaries, hill resorts, waterfalls, beaches, breathtaking valley views, backwaters, mangrove forests, numerous places of worship, historical forts, rich heritage and culture, music and dance festivals comprise the tourism wealth of Tamil Nadu. These attractions are enchanting the visiting tourists and making them come again.

The spatial distribution of tourism spots over the space is not distributed evenly. As noted by Bele'n Gómez Martín (2005), tourist activities are not distributed homogeneously in space; rather, certain activities are concentrated in specific points or areas. Numerous factors account for this pattern, in keeping with the varied and complex nature of tourism itself. Among the several factors of determining the tourist flow of a region climate and weather plays an important

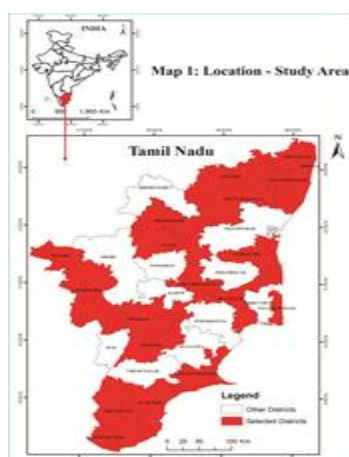
role. Susanne Becken mentioned (2010) that, Climate and weather are important factors in tourists' decision making and also influence the successful operation of tourism businesses.

An abiotic factor such as weather can be disruptive to certain businesses. Weather sensitive businesses (WSB) such as agriculture, construction, retail, transportation and tourism (travel and leisure) are often the first to feel the financial impact of severe or changing weather (HUSEN, 2011). The previous studies conducted by researchers depict that, the weather of a region is an important factor of the tourism. Therefore it is necessary to analysis the weather of a region to assess the level of tourists flow and nature of tourist spots. Therefore the present study has been conducted to analysis the temporal variation of domestic and foreign tourist arrivals in districts wise of Tamil Nadu and its relationship with the trend of precipitation between the year 2006 and 2009.

Study Area:

Tamil Nadu is the southernmost state of India, which is surrounded by Kerala in West, Andhra Pradesh in North, Bay of Bengal in East, Kamataka in North west, while Arabian Sea, Bay of Bengal and Indian Ocean meets in the south (map:1). It is the eleventh largest state of India. According to the census of India, the population of Tamil Nadu is 72,147,030. Tamil Nadu is one of the most attractive tourist states in India, the report of Tamil Nadu tourism departments

shows positive growth rate of tourist arrivals in the state, the growth of total arrivals in the year 2010 was 31.60 per cent, which has been increased into 32.36 per cent in 2011, then the growth has been increased in the year 2012 into 34.01 per cent. This clearly shows the rising trend of the tourism industry in the state. The state is the second largest foreign tourist arrivals of India next to Maharashtra and it is in third position in domestic tourist arrivals next to Andhra Pradesh and Uttar Pradesh.



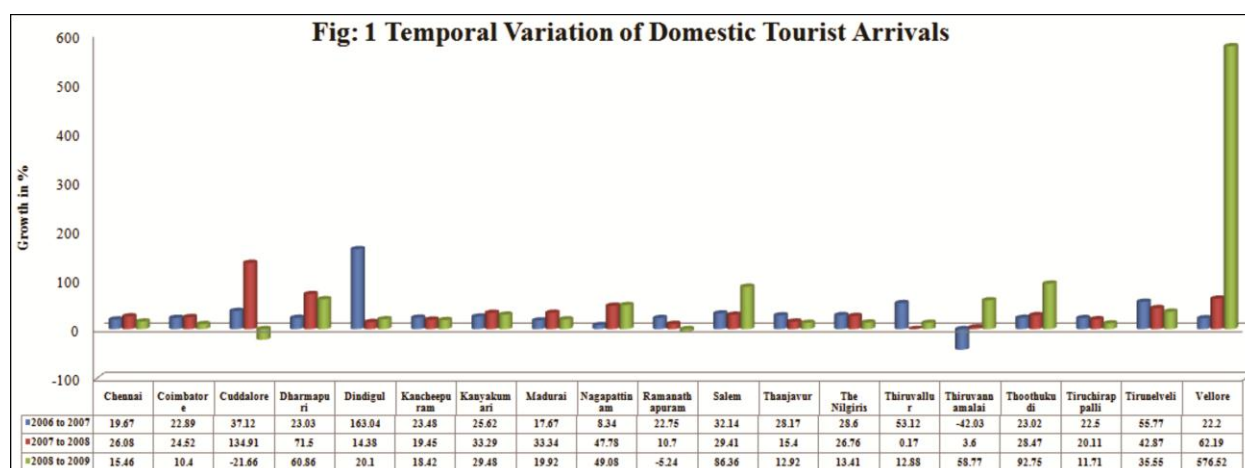
The state receives the rainfall in four distinct periods, such as South-West Monsoon Season (June to Sep), North-East Monsoon Season (Oct to Dec), Winter Season (Jan to Feb) and Hot-Weather Season (Mar to May). The state receives the major part of its annual rainfall during the

northeast monsoon season. The Coastal areas receives about 60% of its annual rainfall and the interior Tamil Nadu receives about 40-50% of annual rainfall during northeast monsoon (IMD (1973), Selvaraj (2011)).

Methods and Materials:

The present study has been conducted based on the secondary data which have been collected from the concern department. The district wise rainfall data have been collected from the Department of Statistics and number of domestic and foreign tourist arrivals has been collected from the Department of Tourism Tamil Nadu. The department of tourism has been documented number of domestic and foreign tourist arrivals only for 19 districts in Tamil Nadu based on the tourist spots. Therefore the present study has been concentrated only on the 19 districts for which data is available (map: 1).

The collected district wise number of domestic and foreign tourist arrivals has been mapped in ArcGIS to find out spatial and temporal variations, then the rainfall data of 19 selected districts have been analyzed with number of tourist arrivals, finally the statistical analysis correlation coefficient has been done to assess the relationship between rainfall and number of tourist arrivals.



Result and Discussion:

The variation and growth rate of year wise domestic and foreign tourist arrivals have been calculated based on the collected data and it has been used to prepare the graph shown below.

Temporal Variation of Domestic Tourist Arrivals:

The figure 1 created to assess the temporal variation of domestic tourist arrivals in district wise of Tamil Nadu shows that, during the year 2007 all the districts had positive growth of domestic tourist arrivals except the district Thiruvannamalai which had negative growth. Especially the districts Thiruvallur (53.12 %) and Tirunelveli (55.77 %) had the growth of more than

50 per cent while the district Dindigul (163.04 %) had the growth of more than 100 per cent.

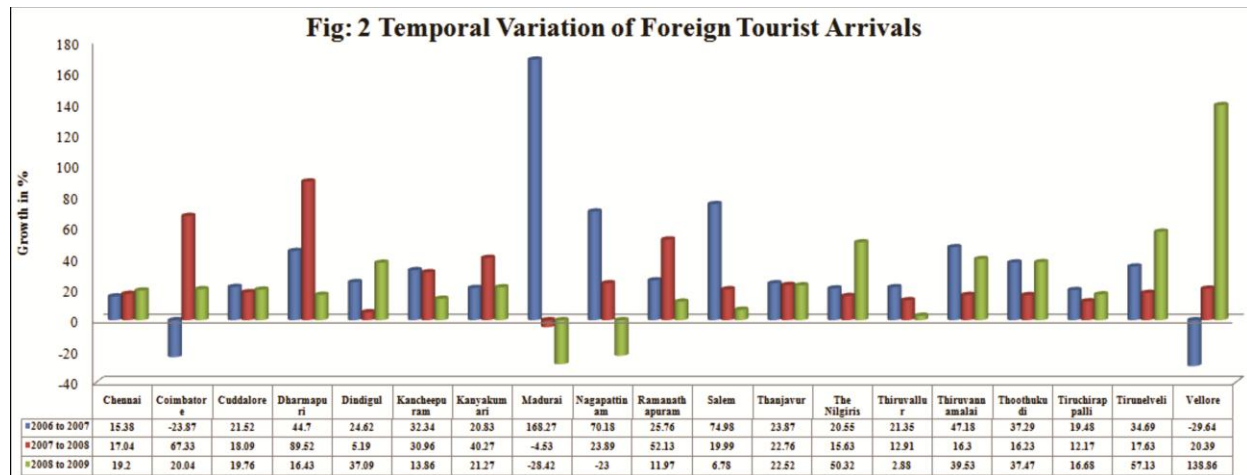
The number of domestic tourist arrivals in the year of 2008 had increased in all the districts, notably the districts Vellore (62.19 %) and Dharmapuri (71.5 %) had more than 50 per cent of growth while the district Cuddalore (134.91 %) had more than 100 per cent of growth. The districts Thiruvallur (0.17 %) and Thiruvannamalai (3.6 %) had the least growth of domestic tourist arrivals in this year.

The variation of number of domestic tourist arrivals between 2008 and 2009 depicts that, all the districts had positive growth while only two districts

had negative growth, such as Cuddalore (-21.66 %) and Ramanathapuram (-5.24 %). The notable per cent of positive growth had happen in the districts Thiruvannamalai (58.77 %), Dharmapuri (60.86 %), Salem (86.36 %) and Thoothukudi (92.75 %) while the district Vellore (576.52 %) had risen very high (1,01,194 in 2008 to 6,84,602 in 2009). The overall view of domestic tourist arrivals variation shows the positive growth in all the districts, even though few districts had negative growths in some years the positive growth had happened in the next years.

Temporal Variation of Foreign Tourist Arrivals:

The figure 2 created to assess the foreign tourist arrivals in districts wise of Tamil Nadu has shown below. The analysis of 2007 growth shows that, only 2 districts had negative growth, such as, Vellore (-29.64 %) and Coimbatore (-23.87 %) while rest of the other districts were having positive growth of foreign tourist arrivals, particularly the districts of Nagapattinam (70.18 %) and Salem (74.98 %) had more than 50 per cent of growth and the district Madurai (168.27 %) had more than 100 per cent of growth in 2007.



The growth of foreign tourist arrivals was positive in all the districts except Madurai (-4.53 %), notably the districts Ramanathapuram (52.13 %), Coimbatore (67.33 %) and Dharmapuri (89.52 %) had more than 50 per cent of growth in the year 2008. The growth of 2009 result depicts that, except Madurai (-28.42 %) and Nagapattinam (-23 %) other districts had positive growth, especially the districts The Nilgiris (50.32 %) and Tirunelveli (57.13 %) had more than 50 per cent of growth while the district Vellore (138.86 %) had more than 100 per cent of growth. The overall variation of foreign tourist arrivals shows that, all the districts had positive growth while the districts Coimbatore and Nagapattinam had negative growth in a year which have been changed in other years, the notable point is that, the district Madurai shows continues negative growth in the year 2008 and 2009, so the real scenario of Madurai can be analyzed in deep study with further years data.

As mentioned in the methodology the collected domestic, foreign tourist arrival and rainfall data have been mapped as shown in map 2.

Distribution of Rainfall:

The collected rainfall data have been used to prepare the year wise distribution of rain fall map. The values have been classified into 7 classes, the class NA in the map represents the districts which have not consider for the present study. Then the values of rainfall have been classified as < 300, 300-600, 600-900, 900-1200 and >1200 and have been mapped in ArcGIS.

The table 1 shown below clearly illustrates the number of districts comes under the each class respective to the selected years. The table describes that, most of the districts had received rainfall between 600-900 and 1200-1500 mm. while only one district had received 300-600 mm. during the year 2007. The number of districts received > 1500 mm. rainfall is less than other previous three classes, during the year totally 4 districts had received > 1500 mm of rainfall which varies one in 2006, 2007 and two in 2009.

Table 1: Frequency Analysis of Classified Rainfall Districts

Rainfall Classes	Years			
	2006	2007	2008	2009
300-600	0	1	0	0
600-900	9	5	2	8
900-1200	5	6	6	7
1200-1500	4	6	7	2
>1500	1	1	4	2

Correlation Analysis:

Once the individual analysis of number of tourist arrivals and rainfall have been over, the correlation of distribution of rainfall and number of tourist arrived has been done. The Pearson correlation has been used in SPSS to find out the relationship of selected two variables. The result of correlation analysis has shown in table 2.

Table 2: Correlation Analysis

Years	D-2006	D-2007	D-2008	D-2009	F-2006	F-2007	F-2008	F-2009
R-2006	.229	.165	.209	.172	.381	.327	.351	.407
R-2007	.147	.066	.080	.029	.260	.207	.232	.294
R-2008	.071	.043	.068	-.008	.096	.050	.073	.128
R-2009	.046	.011	.041	-.017	.076	.039	.058	.115

****.** Correlation is significant at the 0.01 level (2-tailed). (R = Rainfall, D = Domestic Tourist Arrivals, F = Foreign Tourist Arrivals)

The result of correlation analysis shows that, positive correlation between all the years with domestic and foreign tourist arrivals except 2009 domestic tourist arrivals with 2008 and 2009 rainfall data. The overall assessment of relationship between rainfall and number of tourist arrivals depicts that, there is positive relationship between these two variables.

Conclusion:

The study conducted to analyze the temporal variation of domestic and foreign tourist arrivals in Tamil Nadu and its relationship with rainfall shows that, number of domestic tourist arrivals in district wise of Tamil Nadu has been increasing gently. The few districts had received negative growth of domestic tourist arrivals in few years but in the next year that districts have shown the positive growth, so the overall assessment of domestic tourist arrivals shows the positive growth in the districts of Tamil Nadu.

The result of district wise foreign tourist arrivals shows the positive growth except few district, such as Coimbatore had negative growth during the 2007 and Nagapattinam had in 2009, but these two districts growth rate is positive in other two years 2008 and 2009 for Coimbatore and 2007 and 2008 for Nagapattinam so in long term view these two districts also had positive growth. The district Madurai had received positive growth in 2007 while 2008 and 2009 were negative, so the continuous years of negative growth makes the doubt to assess the exact scenario of Madurai district, so the study suggest that, the analysis of further years of foreign arrivals in Madurai district would bring out the much more clear idea of it.

The correlation analysis conducted between number of tourist arrivals and distribution of rainfall in district wise of Tamil Nadu shows that, positive correlation between all the years except domestic tourist arrivals with rainfall in the years of 2008 and 2009, but the overall scenario of result represents the positive correlation between the rainfall and the number of tourist arrivals. This positive result clearly states that rainfall plays a considerable role in the tourism arrivals of Tamil Nadu.

References:

1. M. Baker, Belén Gómez Martín (2005), Weather, Climate and Tourism A Geographical Perspective, *Annals of Tourism Research*, Volume. 32, No. 3, pp.571-591
2. Chauhan (2010), Analyzing Tourism Potential of Tamil Nadu State of India : A People – Tourist's Perception Approach, *Journal of Environmental Research And Development* Vol. 5 No. 2, pp.461-482
3. Susanne Becken (2010), The Importance of Climate and Weather for Tourism, *Land Environment and People*, pp.1-23
4. Christopher and Timothy (2010), Application of Geographical Information Systems (GIS) for Decision Support in Eco-Tourism Development, *Environmental Research Journal*, Volume 4, Number 2, pp.187-194
5. Usha Natesan and Anitha Parthasarathy (2010), The potential impacts of sea level rise along the coastal zone of Kanyakumari District in Tamilnadu, India, *J Coast Conserv*, Volume 14, pp.207-214
6. Andrea Bigano (2007), The impact of climate change on domestic and international tourism: A simulation study, *The Integrated Assessment Journal*, Volume 7, Issue 1, Pp. 25-49
7. Braun et al., (1999), Potential impact of climate change effects on preferences for tourism destinations. A psychological pilot study, *Climate Research*, Volume 11, pp.247-254,
8. Anu Chandran (2011), The Dynamics of Tourism Management in World Heritage Sites of Tamil Nadu, *South Asian Journal of Tourism and Heritage*, Volume 4, No 1, pp.113- 124
9. Ana Beatriz Hernandez and Gerard Ryan (2011), Coping with Climate Change in the Tourism Industry: A Review and Agenda for Future Research, *Tourism and Hospitality Management*, Volume 17, Number 1, pp.79-90
10. Verka Jovanović (2008), The Application Of GIS and Its Components In Tourism, *Yugoslav Journal of Operations Research*, Volume 18, Number 2, pp.261-272
11. Samuel Selvaraj and Raajalakshmi Aditya (2011), Study on Correlation between Southwest and Northeast Monsoon Rainfall over Tamil Nadu, *Universal Journal of Environmental Research and Technology*, Volume 1, Issue 4, pp. 578-581
12. Rafidah Husen (2011), Trends of Rainfall in Sarawak and Its Impact on Tourism, the final report submitted at Research Management Institute (RMI), Universiti Teknologi Mara, 40450 Shah Alam, Selangor, Malaysia
13. Tamil Nadu Government Tourism Policy report of 2013-2014, Tourism, Culture and Religious Endowments Department, Demand No.29, Policy Note 2013 – 2014
14. Vargheese Antony Jesurajan (2012), Dimensions of Spiritual Tourism in Tuticorin District of Tamil Nadu in India – A Critical Analysis, *Business Intelligence Journal*, Volume 5, Number 2, pp.245-251
15. K.Kannan and P.Vijayakumar (2012), A Study on Marketing of Tourism Products in Tamilnadu, *South Asian Journal of Marketing & Management Research*, Volume 2, Issue 6, pp.172-177