

## Spatio-temporal Dynamism of Tourist Arrival in Himachal Pradesh, India

### Abstract

Space-time based explanation is needed for understand the nature of tourist arrival. This paper deals with the visual impression of spatial delivery and temporal dynamics of tourist arrival through empirical investigation. Spatio-temporal characteristics of tourist arrival explained based on 1998 to 2016 data of different districts in Himachal Pradesh. Temporal dynamism of tourist arrival explained through general trend and also seasonal character of tourist arrival of different districts in Himachal Pradesh using graphical methods. Spatio-temporal differences of tourist arrival explained using cartographic methodology based on tourist arrival, tourist density and growth rate of tourist arrival among all the districts from the mentioned period and also based on foreign tourist arrival. For this explanation spatial and temporal data collected from tourism department, government of Himachal Pradesh. To fulfill research objective collected data using graphical and cartographic method represented to find out actual reality of the state in terms of tourist arrival.

**Keywords:** Spatial Pattern, Temporal Dynamics, Seasonality of tourism, Domestic tourism, International tourism, Himachal Pradesh.

### Introduction

Tourism in Himachal Pradesh is one of the most important sector of economy and contributes 7% of total GDP of the state. As per 2016 statistics 1613.6 million domestic tourist and 8.80 million foreign tourist arrived in India with annual growth rate of 12.7% for domestic tourist and 9.7% for foreign tourist respectively. India shares 1.17% of world's total tourist arrival and ranked 26<sup>th</sup> position of world's tourist arrival. In 2016 total 18.44 million tourist arrived in Himachal Pradesh out of which 97.5% tourist belongs to domestic tourist and 2.5% is foreign tourist. Due to geographical and cultural diversity, clean and peaceful environment, sacred shrines, historic monuments, streams, friendly and hospitable people, the state is considered as one of the most important destination of tourist in India. The government given priority to government sector and basic infrastructure of tourism such as roads, public utility services, communication networks, airports, water supply and civil amenities etc. facilities provided for the development of tourism in Himachal Pradesh. For the development and management of tourism in Himachal Pradesh Tourism Development Corporation has been established. The increase in tourism infrastructure and other amenities for tourist helps to attract tourist from the country and abroad and over the period of time the arrival of tourist increases in a rapid rate. Though such increase in tourist arrival, there exists spatial variation of tourist arrival in among different districts in Himachal Pradesh.

### Review of Literature

Spatial and temporal explanation is needed for the understanding of tourism phenomenon and the development of tourism planning in a destination region. Some works in recent past on spatio-temporal characteristics mentioned in this literature review part. Different scholars explained the spatio temporal dynamics based on their fields of research works. Guo, et al, 2016 explained the spatio-temporal dynamics of tourist flows to china cities. Whereas Liu et al, 2017 focuses on research on spatial and temporal dynamics and bundles of travel flow of residents visiting urban parks. Yan et al, 2011 explained the spatial pattern and relationship of tourist distribution in Chinese cities using exploratory data analysis method. Chistobaev and Semenova in 2018 focused on the spatio-temporal dynamics of medical tourism whereas Dimabe, 2017 worked on spatio-temporal dynamics of land-use and habitat fragmentation within protected areas for tourism in Sudanian region in West Africa



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## Study Area

Himachal Pradesh, the northern state of India characterized by diversified physical and cultural characteristics and located in 30°22' N to 33°13' N latitude and 75°36' E to 79°02' E longitude covering an area of about 55673 square kilometer. In terms of administrative location Himachal Pradesh bounded by Jammu & Kashmir in north, Tibet in east, Uttarakhand in the south east, Hariyana in south and Punjab in west. The state broadly divided into twelve community development blocks such as Chamba, Lahul&Spiti, Kangra, Kullu, Una, Hamirpur, Mandi, Bilaspur, Solan, Shimla, Kinnaur and Sirmaur etc. The study area altitude varies in between 300 meter to 6816 meter from mean sea level. The physiographic characteristics is concerned the state is broadly divided into three physiographic divisions i.e. Outer Himalayas extended up to Siwalik range, Lesser Himalayas extended from Pirpanjal Range to Dhauladhar range and Greater Himalayas extended from Greater Himalaya range to Zaskar range. The major river i.e. Indus, Beas, Sutlej, Chenab, Ganges, and Yamuna etc. flows in different parts of the state and provides beautiful landscape which attracts tourist. The climatic characteristics is concerned the state basically divided into six micro climatic zones based on the altitudinal variation such as sub-tropical, temperate, sub alpine, alpine, cold arid region and the region above snow line etc. The state as per 2011 census contain 6864602 population where maximum population observed in the low altitudinal regions in the mountain state. There exists the variation of social environment and cultural characteristics among the people in different parts of the state. The diversity of natural environment and socio-cultural characteristics acts as deriving force to attract tourist of both domestic and international origin. Due to the differentiation in destination attractiveness, there exists spatial variation of tourist arrival in Himachal Pradesh.

**Figure 1: Location Map of Study Area**



## Objective and Method

The objective of this paper is to show spatio-temporal dynamics of tourist arrival in different districts in Himachal Pradesh. To fulfill the

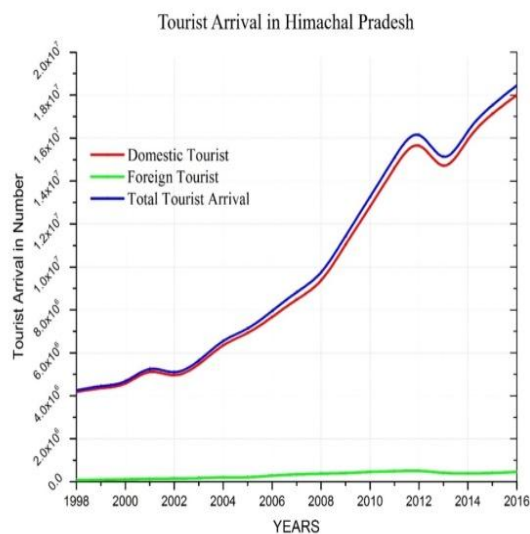
research objective required data from 1998 to 2016 period has been collected from department of tourism and department of economics & statistics, government of Himachal Pradesh. The first step of analysis involves the representation of trend of tourist arrival, domestic and foreign tourist arrival in Himachal Pradesh and the representation of temporal scenario is done based on graphical method. Spatio-temporal dynamism of tourist arrival represented using cartographic method. Based on spatial and temporal data spatial differentiation and temporal variation of tourist arrival from 1998 to 2016 cartographically represented and using composite Z score method tourism efficiency region among different districts calculated based on tourist arrival and tourist density data. The growth rate of tourist arrival from 1998 to 2016 period cartographically represented. The spatial variation of tourist arrival from different countries of the world has been represented using proportionate circle diagram.

## Result and Discussion

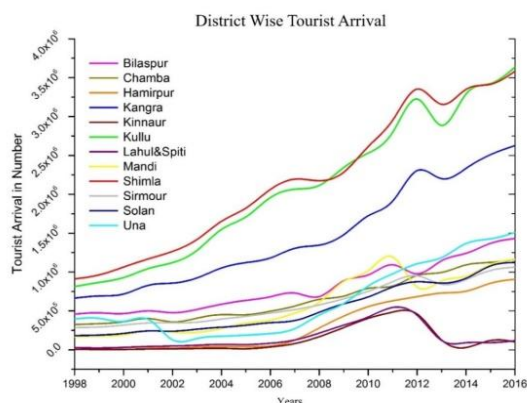
### General Trend of Tourist Arrival

The general trend of tourist arrival in Himachal Pradesh from 1998 to 2016 (Figure 2) indicates that tourist arrival increases over the period of time but the growth is very less in the period 1998 to 2002. After that the growth rate increasing at an alarming rate in between 2002 to 2012 and thereafter around 15% decrease of tourist arrival found in 2013 because of the extreme weather condition and severe flood in Himachal Pradesh. There exists huge gap between domestic and international tourist arrival. The growth of foreign tourist arrival increased but the growth rate is low. The provision of good infrastructural facilities as well as promotion in international market should increase international tourist arrival in Himachal Pradesh. With the parity with increasing tourist arrival the tourism infrastructure in most popular and less popular destination should be developed by the government and it helps to fulfill the satisfaction of tourist.

**Figure 2: Line graph of Tourist Arrival in Himachal Pradesh**

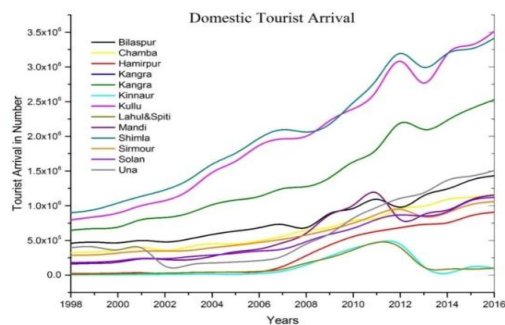


**Figure 3: Line graph of District wise Tourist Arrival in Himachal Pradesh**

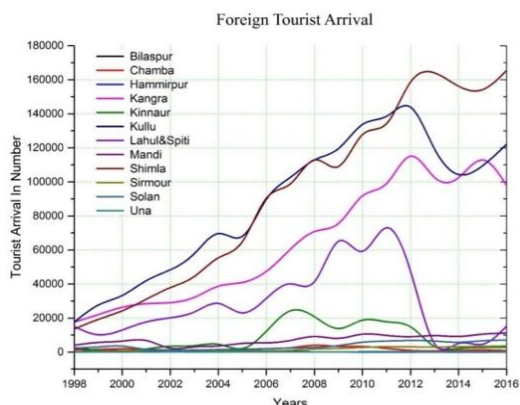


The tourism scenario in different districts in Himachal Pradesh from 1998 to 2016 represented using line graph (Figure: 3). The tourist arrival is more or less similar in case of Chamba, Bilaspur, Hamirpur, Mandi, Sirmour, Solan and Una Districts. The tourist arrival is low observed in case of Lahul&Spiti and Kinnaur district and due to extreme weather condition in the year 2013 abrupt decrease in tourist arrival found. Though in fall of tourist arrival in 2013 Una and Hamirpur districts does not affected by extreme weather condition. Kangra district holds third position in terms of tourist arrival in Himachal Pradesh in between 1998 to 2016. There exists high tourist arrival as well as growth rate in Shimla and Kullu district. Well-developed tourist spots and infrastructural facilities attract much more tourist in Kullu and Shimla district.

**Figure 4: Line graph of domestic Tourist Arrival in Himachal Pradesh**



**Figure 5: Line graph of International Tourist Arrival in Himachal Pradesh**



In terms of domestic tourist arrival Shimla and Kullu district received highest number of tourist over the period of time and Shimla district received much more tourist than Kullu district but the tourist arrival in Kullu district overtake Shimla district after the year 2014 because of good natural environment, scenic beauty and adventure tourism activities and infrastructural facilities provided therein. Kangra district due to its natural environment and scenic beauty attract much more tourist and hold third position within state. There exists quite ups and down in terms of tourist arrival in Una district and the decrease in tourist arrival found in between 2001 to 2002 and after 2017 the tourist arrival growth rate increases and after 2011 it overtakes all the districts except and holds forth position based on tourist arrival in state at recent period. Lahul&Spiti and Kinnaur districts received less number of domestic tourists (Figure 4).

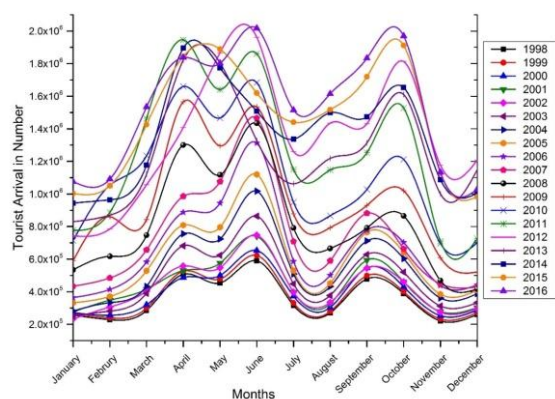
The foreign tourist arrival in Himachal Pradesh increasing from 1998 to 2016 but the growth rate foreign tourist arrival is not similar in all the districts (Figure3). The growth of foreign tourist arrival in 1998 to 2004 is highest found in Kullu district, Shimla district holds second position, Kangra district third and fourth position holds Hamirpur district. After 2004 significant growth rate of tourist arrival found in Kullu, Shimla, Kangra district upto 2012. After 2012 foreign tourist arrival decreased in Kullu, Kangra and Hamirpur district due to extreme weather condition and severe flood in the mountain state Himachal Pradesh. The other districts such as Chamba, Bilaspur, Lahul&Spiti, Mandi, Solan, Sirmour and Una etc. represent positive growth of foreign tourist arrival but growth is not prominent in nature.

### Seasonality of Tourist Arrival

There exists positive relationship between climate and tourist arrival. Suitable climatic condition attracts tourist where harsh climatic condition in any region causes decrease in tourist arrival. The seasonality of tourism in Himachal Pradesh broadly categorized into three period i.e. summer (March to June), Rainy (July to September) and winter (October to February). Sumer seasons receive maximum number of tourist characterized by peak season due to its pleasant climatic condition. After that tourist arrival decreases during rainy seasons due to different problems i.e. landslide and rock fall, road blockage faces by tourist and again during end of September to December tourist arrival increases in an alarming rate due to its charming climatic condition and scenic beauty in mountain state. In late winter, tourist arrival decreases due to its climatic extremity and basically adventure tourist prefer to travel in this season in Himachal Pradesh.



**Figure 6: Line graph of seasonal Tourist Arrival in Himachal Pradesh**

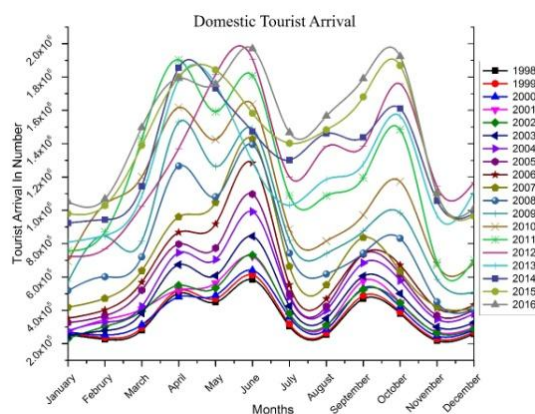


The seasonal characteristics and tourist arrival positively related to each other where climate has dominant role to determine the nature of tourist arrival in a destination region. To understand the seasonal characteristics of tourist arrival line graph (Figure 6) of different months from 1998 to 2016 prepared. Based on the diagrams it is clear that the tourist arrival in Himachal Pradesh is seasonal in nature and it can be explained through peak period and lean period. Summer period basically April to June due to charming weather condition maximum number of tourist arrived and also in early winter basically September to October large number of tourist arrived to meet their recreational needs. These two seasons is the peak period of tourism in Himachal Pradesh. On the other hand during rainy seasons basically June to July months due to extreme rainfall and landslide tourist avoid visiting this region. And during winter i.e. December to February extreme cold weather and abundant snowfall leads towards the blockage of roads and lack of infrastructural facilities very less number of tourist arrived in this region. But adventure tourist for skiing and snow related tourism activities arrived in this region. During lean periods such as winter and rainy season vary less number of tourist arrived to visit Himachal Pradesh.

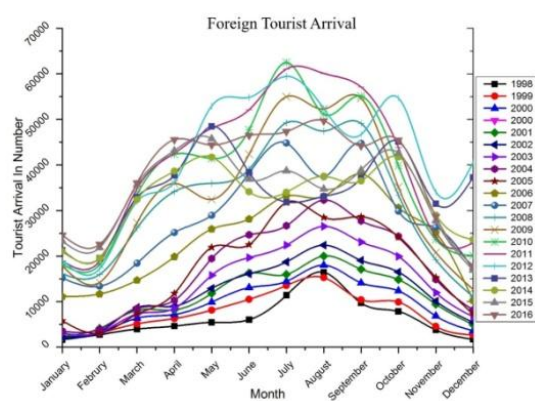
### Month Wise Domestic Tourist Arrival

The seasonal characteristics of domestic tourist arrival depend upon two factors i.e. internal factor related to destination and the external factor which related tourist origin region. The internal factors includes the climate, scenic beauty, culture, heritage, society and hazards in the destination region whereas the external factors includes vacation in tourist place of origin, climatic condition, tourist behavior and recreational needs etc. During summer season the maximum number of tourist arrived in this region because the charming weather and also the hot weather in non-mountain regions of the country. This period is the peak period of tourist arrival and also in early winter basically from October to November large number of tourist arrived. During extreme winter and rainy period i.e. July to August and December to February lack of tourist arrival found in this region (Figure 7).

**Figure 7: Line graph of seasonal Domestic Tourist Arrival in Himachal Pradesh**



**Figure 8: Line graph of seasonal International Tourist Arrival in Himachal Pradesh**



### Month wise Foreign Tourist Arrival

The foreign tourist arrival does follow seasonality characteristics as domestic tourist does. The seasonal characteristic of foreign tourist arrival represented from the year 1998 to 2016 (Figure 8). Foreign tourist basically concentrated from May to October month and rest period less number of foreign tourist arrived to visit Himachal Pradesh. July to September is the peak period and December to February is the lean period for international tourist arrival. The provision of good infrastructural facilities and security to the foreign tourist by the government and promotion in international market should increase international tourist arrival in Himachal Pradesh.

### Spatio-temporal Dynamism of tourist arrival

Space and time are the fundamental in geographical investigation where temporal characteristics include one dimension (Time) whereas space has three dimensions (latitude, Longitude and elevation). The geographical investigation needs space-time based explanation to understand the actual characteristics exists in reality (Raper, 2000). So the space and time is interrelated, interconnected and interdependent (Chetry et al, 2010). The spatio-temporal characteristics of tourist arrival of all the districts in Himachal Pradesh can be understood by using cartographical methods in different year basis where each diagram represents spatial differentiation in tourist arrival. The spatial differential of tourism in Himachal Pradesh explained based on the data of number of Tourist

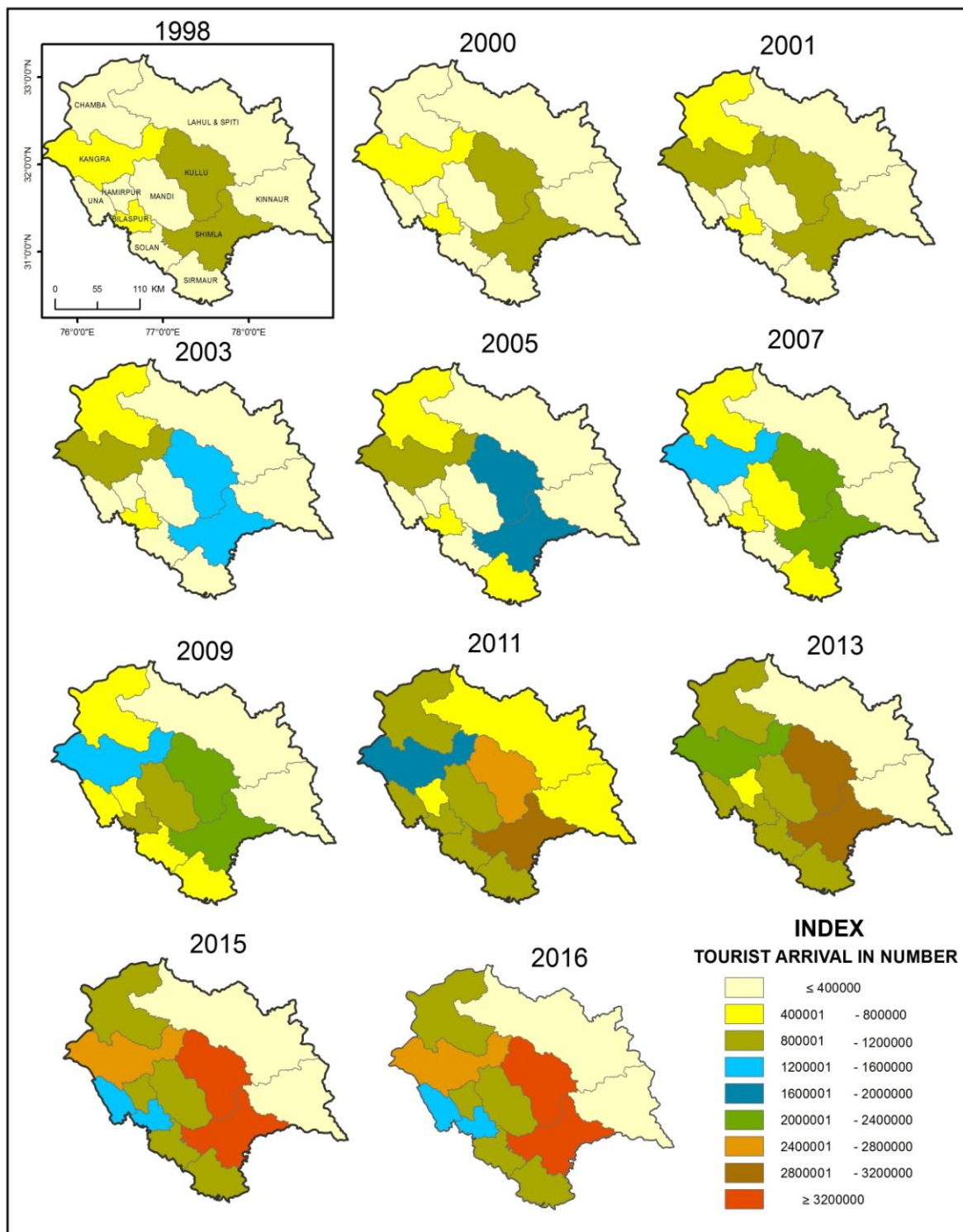
arrival, tourist density and the growth rate of tourist arrival etc.

diagram (Figure 9). Kullu district and Shimla district received most of the tourist in Himachal Pradesh.

**Based on Tourist Arrival**

The tourist arrival in Himachal Pradesh, Increases over two decades represented in above

**Figure9: District wise tourist arrival maps from 1998 to 2016**

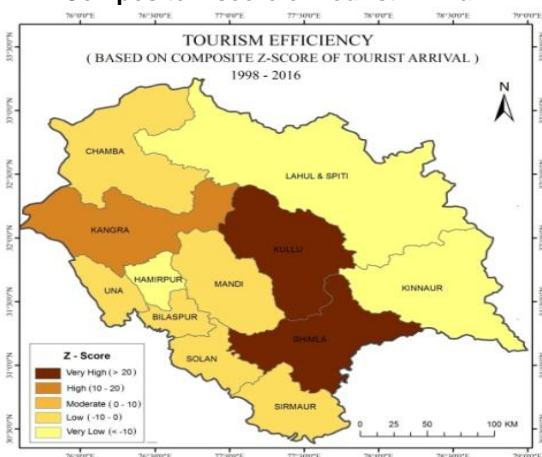


The tourist arrival is dynamic in nature in all the districts in Himachal Pradesh. The nature of tourist received of different districts can be explained through the calculation of tourism efficiency based on composite Z score method. For this analysis, tourist arrival in all the districts from

the year 1998 to 2016 has been taken into consideration. The Z score value calculated of year wise tourist arrival and composite score calculated (Table 1) to understand the tourism efficiency in the districts in Himachal Pradesh.

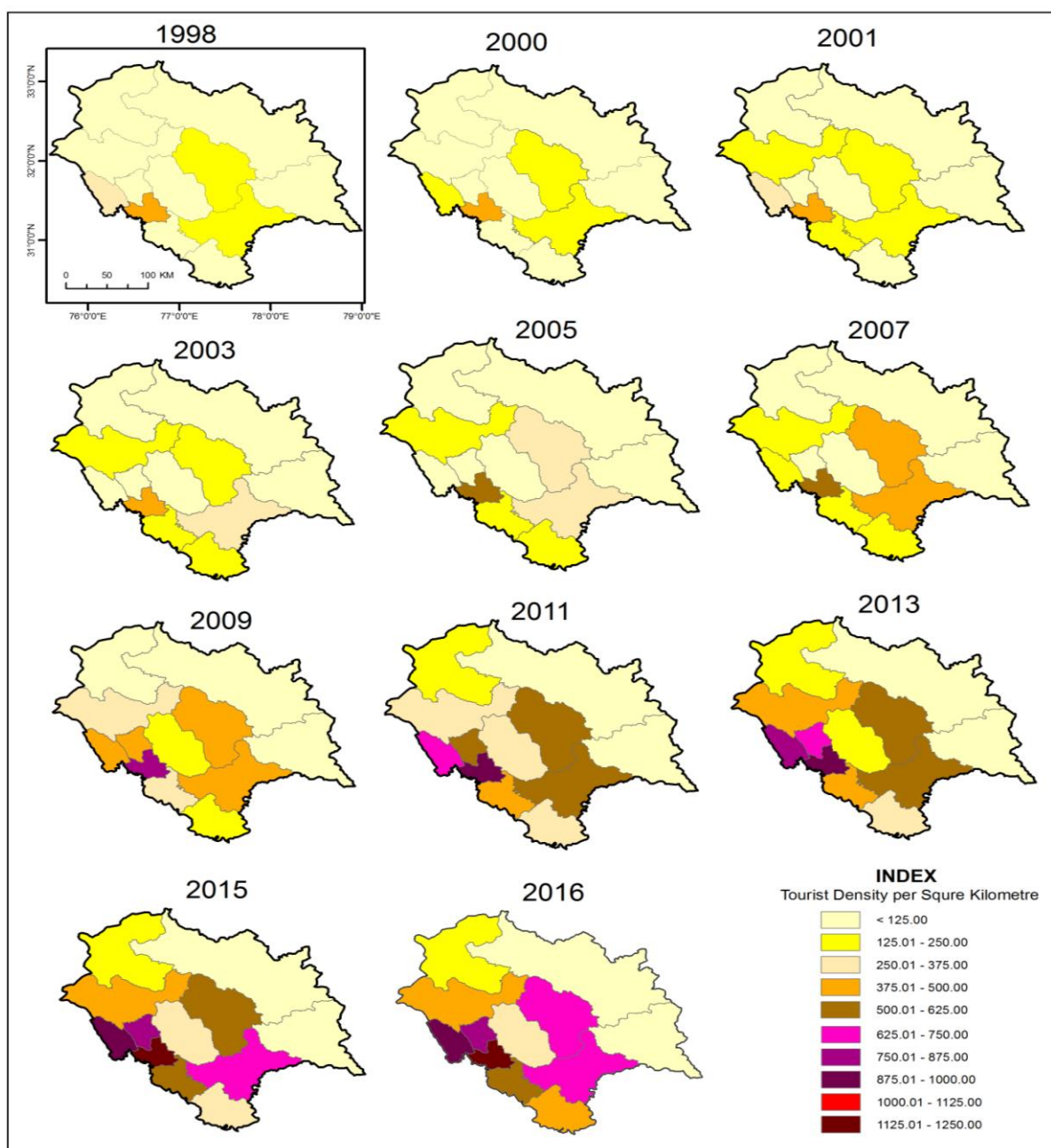


**Figure 10: Tourism Efficiency Maps Based On Composite Z score of Tourist Arrival**



Based on composite score data the region has been classified into five classes' i.e. very high, high, moderate, low and very low. The Shimla and Kullu district indicates the most efficient region of tourism in terms of tourist arrival in Himachal Pradesh. Kangra district show high efficient for tourist arrival in Himachal Pradesh. The moderate tourism efficient found in the districts i.e. Chamba, Mandi, Una, Bilaspur, Solan and Sirmour etc. Due to lesser number of tourist arrival in Hamirpur district fall under very low tourism efficiency region whereas Lahul&Spiti and Kinnaur due to its harsh environmental condition belongs to this category (Figure 10).

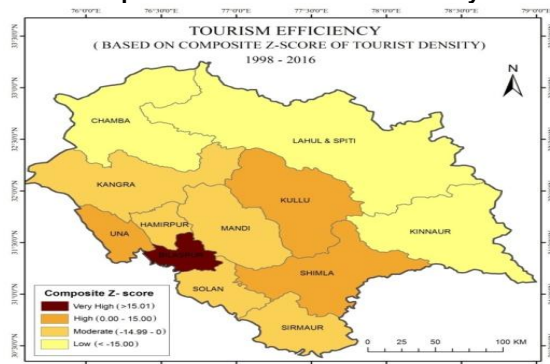
**Figure 11: District Wise Tourist Density Maps from 1998 to 2016**



### Based on Tourism Density

Tourism density is the number of people per unit area. The nature of tourist arrival based on its geographical boundary reflects the actual status of tourist received of different districts in Himachal Pradesh. Tourism density maps from 1998 to 2016 having two year interval prepared to show spatial and temporal differences of tourist arrival (Figure 11).

**Figure 12: Tourism Efficiency Maps Based On Composite Z Score Of Tourist Density**



Tourism efficiency in any region can be judge based on composite Z score of tourist density of different periods. Tourism efficiency map of Himachal Pradesh prepared based on tourist density from 1998 to 2016 (Figure 12). Based on composite Z score value (Table2) the state has been divided into five group i.e.

very high, high, moderate and low tourism efficiency region. The result reflects that the Bilaspur district belongs to Very high efficiency region and Shimla, Kullu and Una districts belongs to high efficiency region. Kullu district though its large geographical area received large number of tourist and within Kullu district Beas valley received maximum tourist. The districts like Kangra, Hamirpur, Mandi, Solan and Sirmour fall into moderate efficiency region. The districts i.e. Chamba, Lahul&Spiti and Kinnaur districts belongs to low efficiency region based on tourism density. Very less number of tourist arrived in these large geographical area of these three districts.

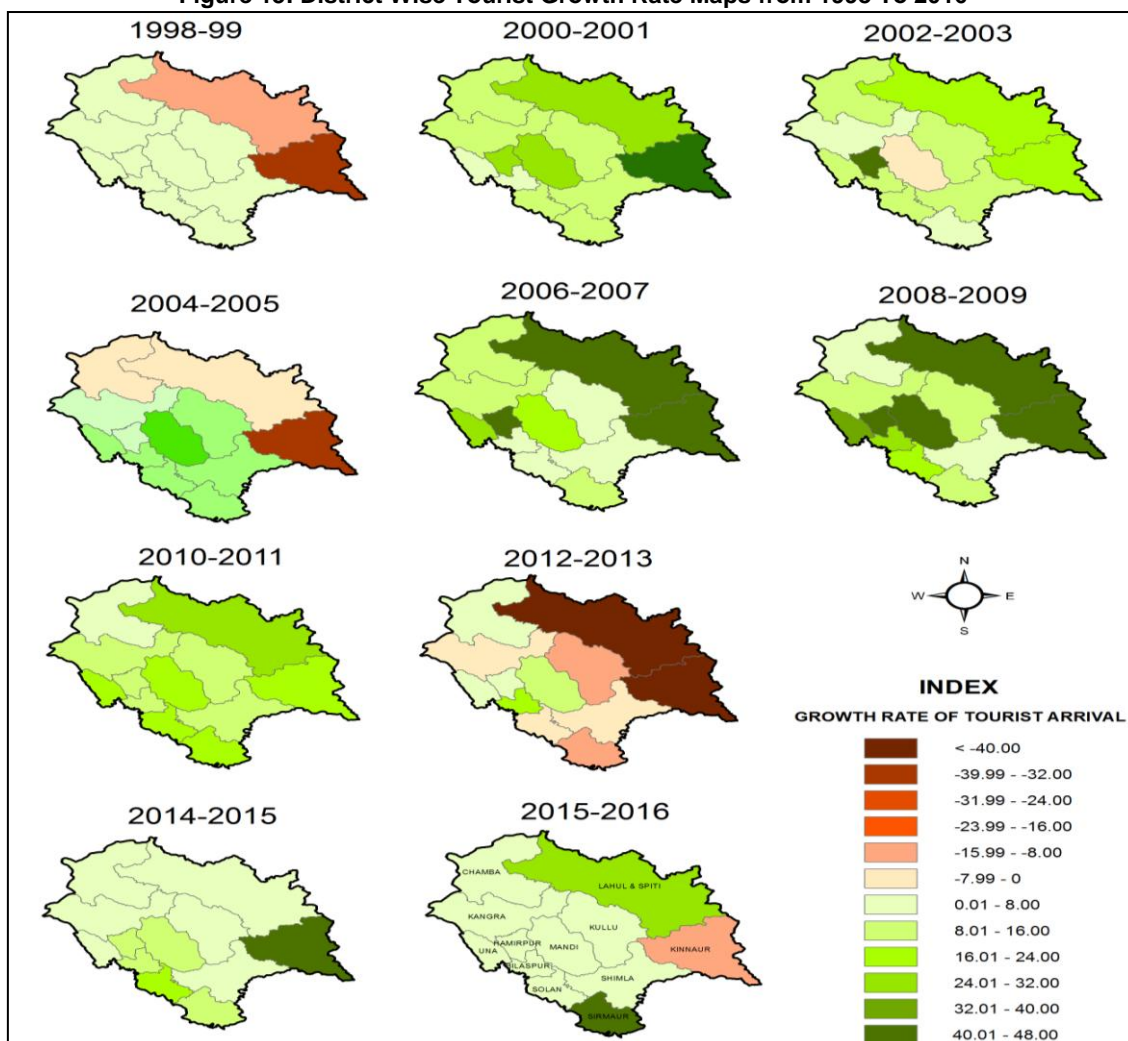
### Based on Tourist Growth rate

The growth rate of tourism reflects the increasing potentiality of tourism as well as the nature of tourism development in a region. The growth rate of tourism refers the percentage of change of tourist arrival within a specific time period.

$$Gr = \frac{V_1 - V_0}{V_0} * 100$$

The annual growth rate of tourist arrival in different districts of Himachal Pradesh calculated based on above formula. Where Gr is the Growth rate,  $V_1$  is the present tourist arrival,  $V_0$  is past tourist arrival. The growth rate of tourist arrival cartographically represented to show the spatial and temporal difference (Figure 13).

**Figure 13: District Wise Tourist Growth Rate Maps from 1998 To 2016**



During 1998 to 1999 the negative growth of tourism found in Kinnaur and Lahul&Spiti District and rest of the districts in Himachal Pradesh reflects positive growth of tourism. But in 2000 to 2001 all the districts represents positive growth of tourism and Kinnaur district represents greater than 40% growth rate. During 2002 to 2003 except Mandi district all district reflects positive growth of tourist arrival where Hamirpur District show very high positive growth. The negative growth rate found in Kinnaur, Lahul&Spiti and Chamba districts where as the very high negative found in Kinnaur District due to its extreme environmental condition. During 2006 to 2007 and 2008 to 2009 all the districts reflects positive growth but the districts like Lahul&Spiti, Kinnaur and Hamirpur etc. very high positive growth rate of tourism has been found. But in 2012 to 2013 the major parts of Himachal Pradesh reflects negative growth of tourism due to extreme weather and environmental hazards in mountain regions. During this period Hamirpur, Mandi, Bilaspur, Una and Chamba districts show positive tourist growth. After the extreme hazards during 2014 to 2015 less positive growth rate found in all districts of Himachal Pradesh where Kinnaur district reflects high positive growth rate. But Kinnaur district during 2015 to 2016 show very high negative growth of tourism whereas Sirmour district reflects high positive growth rate and except these

all districts represent positive growth of tourism. From this analysis it can say that the nature of tourist arrival and growth rate of tourism in Himachal Pradesh determined by climatic condition. In Kullu district during 1998 to 2001 positive growth rate found but in 2012 to 2013 negative growth found due to extreme weather and hazard in mountain region.

### Based on Country Wise Foreign Tourist Arrival

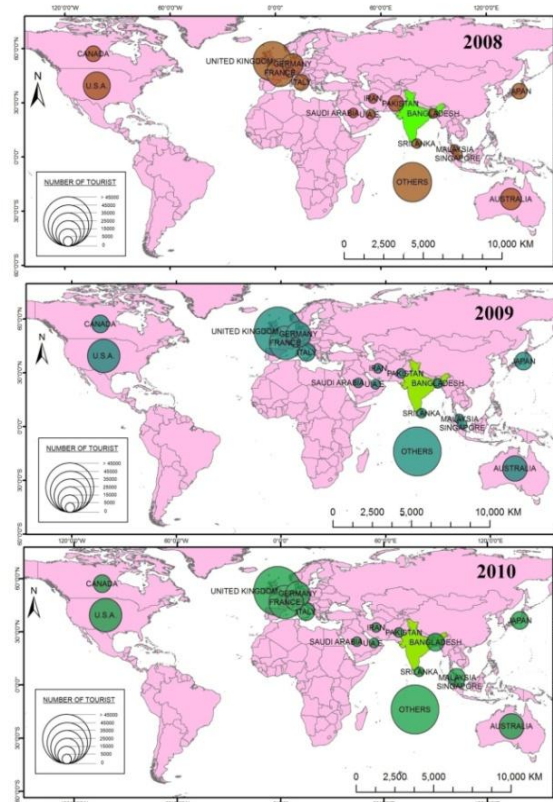
The international status of tourism of a country depends on the nature of foreign tourist arrival. The growth rate of foreign tourist arrival in India is 9.7% in 2015 to 2016 whereas the growth rate of international tourist world is 3.9%. The total foreign exchange earnings from foreign tourist is 154146 Crore characterized by 14% annual growth rate. India in terms of international tourist arrival ranks 8<sup>th</sup> position in Asia and Pacific region and 25<sup>th</sup> in the world. Foreign tourist arrival in Himachal Pradesh is not significant at present situation and over the period of time the arrival of international tourist in Himachal Pradesh positive in nature. The growth rate of foreign tourist arrival calculated based on tourist arrival in different periods. Positive growth rate found from the year 2008 to 2012 where during 2009 to 2010 13% growth rate found. But during 2012 to 2013 (-17.2) and 2013 to 2014 (-5.8%) negative growth rate found (Table 3).

**Table 3:** Growth rate of tourist arrival in Himachal Pradesh

Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Growth rate of Foreign Tourist Arrival in HP	5.3	13.3	6.9	3.2	-17.2	-5.8	4.3	11.3

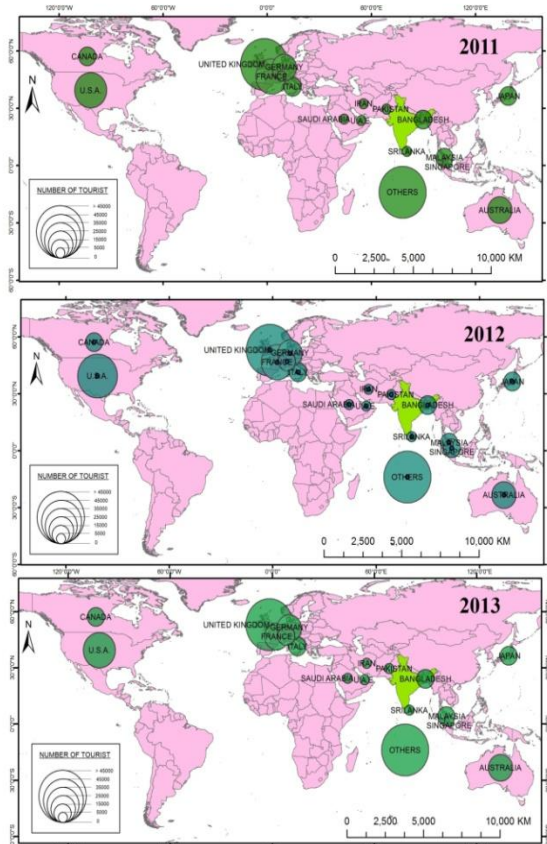
The nature of tourist arrival in Himachal Pradesh from different countries of the world represented based on proportionate circle diagram. International tourist in Himachal basically concentrated from North America, Western and southern Europe, Middle East, Australia and South east and East Asian countries. Though from other parts of the world smaller number of international tourist received by Himachal Pradesh. From the diagrams (Figure 14a, b &c) it can be interpreted that the maximum number of international tourist received from United Kingdom over the period of time. During 2008 the total number of tourist is 64938 and it increased up to 83680 tourists from United Kingdom. More or less constant percentage of tourist arrived from United State of America and there is slight increase of tourist arrival from 2008 to 2016.

**Figure 14a: International Tourist from different Arrive in India**

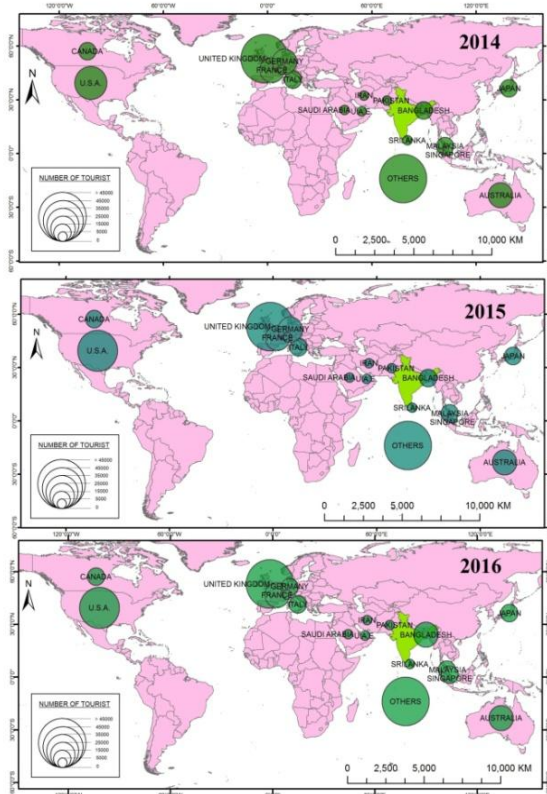




**Figure 14b: International Tourist from different arrive in India**



**Figure 14c: International Tourist from different arrive in India**



Tourist arrival increased from 2008 to 2011 and thereafter tourist arrival becomes negative found in case of France. Germany reflects the positive growth of tourist arrival in between 2008 to 2012 and thereafter decreasing trend of tourist arrival also observed. There is negative growth of tourist arrival found in case of Italy. The constant percentage of tourist arrived from Canada during 1998 to 2016 has been found and though the number of tourist increased within this time period. International tourist from UAE increased from 2008 to 2016. Due to political instability tourist arrival from Pakistan indicates negative trend. Malaysia indicates positive growth and trend of tourist arrival. The constant growth of tourist arrival from 2008 to 2016 found in case of Switzerland. Positive growth of tourist arrival from Bangladesh and Srilanka from 2008 to 2016 observed but the growth rate and number of tourist arrival is higher in case of Bangladesh than Srilanka. In case of Japan, decreasing trend of tourist arrival found since the year 2011. There is positive growth of tourist arrival found in case of Saudi Arabia and also Singapore whereas Singapore received much more tourist than Saudi Arabia. In case of Iran ups and downs in terms of tourist departure towards India found. Other than these countries of the world, large volume of tourist (more or less 50% tourist) arrived in India to meet their recreational needs. From this analysis it can be interpreted that there is both positive and negative growth of tourist arrival found towards Himachal Pradesh. Some countries indicate positive and some negative.

**Conclusion**

Space and time based analysis helps to understand the processes involved in and factors responsible for the tourist flows. This paper tries to visualize the spatial pattern and temporal dynamics of both domestic and international tourist arrival in different districts of Himachal Pradesh. The temporal character of tourist arrival reflects the positive growth of tourist arrival from 1998 to 2016 except 2011-12 and 2012-13. As per the observation domestic tourist arrival is seasonal in nature but foreign tourist arrival does not follow such rule. Due to the rough topographic condition, inaccessible transport networks and climatic characteristics in some districts less number of tourist arrived to visit where accessible transportation network and basic infrastructural facilities to the tourist large number of tourist arrived in some popular destinations or the districts. The growth rate of tourist arrival varies both spatial and temporal basis. The maximum number of districts represent positive growth rate of tourist arrival except Lahul&Spiti and Kinnaur during 1998-99, 2004-05 and 2012-13. Due to extreme climatic condition in the mountain districts of Himachal Pradesh during 2011-12 and 2012-13 represents negative growth rate of tourist arrival. Foreign tourist arrival in Himachal Pradesh increases over the period of time but the growth rate is not prominent. There exists spatial differentiation of foreign tourist arrival among the districts in the state. The increase of better tourism and basic infrastructural facilities to the tourist within the districts in the state should minimize the level of

spatial differentiation of tourist arrival and also helps to boost tourist arrival in Himachal Pradesh. International tourist directly generates funds to the local economy of the destination and due to this the marketing strategies has to be improve to attract much more international tourist from different parts of the world. This paper helps to the planner to develop planning strategies for the development of tourism in the state. For the development of tourism infrastructure proper planning strategies has to be developed and its proper implementation with the participation of state government, local administration, local stakeholder, non-governmental organizations and local people should bring the fruitful result of tourism planning at ground level.

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# Asian Resonance

**Table 1: Composite Z score of Tourist Arrival**

Districts	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Composite Z-score
Bilaspur	0.341	0.320	0.215	0.163	0.121	0.101	0.069	0.064	0.028	-0.008	-0.186	-0.094	-0.187	-0.194	-0.359	-0.118	-0.108	-0.083	-1.248	-1.164
Chamba	0.053	-0.105	-0.084	-0.091	-0.156	-0.134	-0.165	-0.231	-0.237	-0.236	-0.237	-0.372	-0.412	-0.519	-0.381	-0.272	-0.246	-0.305	-1.205	-5.335
Hamirpur	0.070	-1.067	-1.039	-1.043	-0.940	-0.901	-0.887	-0.882	-0.873	-0.835	-0.769	-0.734	-0.718	-0.744	-0.647	-0.543	-0.557	-0.549	-0.010	-13.667
Kangra	2.160	0.988	0.936	1.011	1.007	0.942	0.889	0.842	0.735	0.779	0.771	0.742	0.806	0.777	0.937	0.959	0.894	0.950	0.811	17.937
Kinnaur	0.022	-1.125	-1.104	-1.105	-0.960	-0.944	-0.927	-0.931	-0.891	-0.896	-0.930	-0.942	-0.916	-0.916	-0.864	-1.158	-1.222	-1.215	0.715	-16.308
Kullu	2.643	1.524	1.540	1.566	1.620	1.677	1.762	1.781	1.838	1.817	1.881	1.961	1.858	1.827	1.836	1.659	1.774	1.778	1.295	33.637
Lahul & Spiti	0.090	-1.064	-1.026	-1.022	-0.878	-0.854	-0.838	-0.843	-0.822	-0.833	-0.864	-0.897	-0.892	-0.846	-0.880	-1.165	-1.165	-1.241	-0.062	-16.101
Mandi	0.536	-0.602	-0.567	-0.509	-0.462	-0.513	-0.480	-0.403	-0.400	-0.360	-0.289	-0.106	-0.116	-0.075	-0.525	-0.385	-0.380	-0.330	0.209	-5.757
Shimla	2.967	1.820	1.926	1.886	1.957	1.969	1.948	1.962	1.986	1.995	1.967	1.877	1.967	2.010	1.961	1.935	1.827	1.770	0.801	36.531
Sirmaur	0.927	-0.238	-0.207	-0.237	-0.182	-0.240	-0.267	-0.264	-0.271	-0.300	-0.339	-0.419	-0.462	-0.453	-0.384	-0.426	-0.420	-0.400	1.166	-3.415
Solan	0.591	-0.557	-0.517	-0.503	-0.436	-0.427	-0.450	-0.445	-0.446	-0.491	-0.476	-0.512	-0.555	-0.533	-0.460	-0.412	-0.404	-0.346	-1.096	-8.475
Una	1.284	0.107	-0.074	-0.116	-0.691	-0.677	-0.654	-0.650	-0.646	-0.633	-0.528	-0.505	-0.373	-0.333	-0.234	-0.076	0.006	-0.031	-1.376	-6.199

**Table 2: Composite Z Score of Tourist Density**

Districts	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Composite Z-score
Bilaspur	2.419	2.403	2.393	2.365	2.440	2.423	2.332	2.309	2.242	2.280	2.067	2.254	2.077	2.058	1.561	1.854	1.820	1.888	0.871	40.053
Chamba	-0.600	-0.606	-0.621	-0.643	-0.613	-0.610	-0.586	-0.624	-0.633	-0.695	-0.866	-0.953	-1.009	-1.063	-1.029	-0.900	-0.874	-0.916	-1.191	-15.031
Hamirpur	-0.865	-0.869	-0.893	-0.902	-0.918	-0.846	-0.802	-0.814	-0.822	-0.557	0.044	0.426	0.638	0.622	0.712	0.761	0.649	0.745	2.101	-1.593
Kangra	-0.020	-0.021	-0.009	0.035	0.202	0.174	0.184	0.157	0.100	0.085	-0.051	-0.207	-0.223	-0.264	-0.072	-0.133	-0.153	-0.174	-0.773	-1.161
Kinnaur	-1.026	-1.037	-1.099	-1.136	-1.069	-1.084	-1.034	-1.038	-1.031	-1.103	-1.305	-1.252	-1.263	-1.255	-1.308	-1.339	-1.363	-1.345	-0.878	-21.963
Kullu	0.261	0.292	0.374	0.406	0.670	0.739	0.845	0.868	0.948	0.902	0.851	0.618	0.477	0.409	0.619	0.336	0.420	0.345	-0.646	9.733
Lahul & Spiti	-0.860	-0.895	-0.905	-0.901	-0.785	-0.765	-1.020	-1.019	-1.028	-1.121	-1.371	-1.358	-1.406	-1.395	-1.457	-1.375	-1.354	-1.378	1.345	-19.048
Mandi	-0.669	-0.668	-0.679	-0.649	-0.591	-0.655	-0.587	-0.515	-0.517	-0.511	-0.530	-0.381	-0.410	-0.383	-0.811	-0.661	-0.658	-0.619	-0.530	-11.026
Shimla	0.525	0.548	0.712	0.717	1.040	1.090	1.122	1.143	1.208	1.192	1.089	0.712	0.694	0.667	0.871	0.638	0.586	0.468	-0.671	14.351
Sirmaur	-0.150	-0.164	-0.118	-0.145	-0.027	-0.107	-0.111	-0.111	-0.119	-0.163	-0.232	-0.333	-0.373	-0.354	-0.315	-0.412	-0.417	-0.387	0.257	-3.780
Solan	-0.212	-0.215	-0.156	-0.122	-0.027	-0.018	-0.042	-0.042	-0.044	-0.099	0.038	0.024	0.000	0.058	0.115	0.066	0.051	0.162	-0.050	-0.510
Una	1.214	1.188	0.970	0.940	-0.367	-0.359	-0.290	-0.295	-0.301	-0.197	0.284	0.423	0.795	0.893	1.113	1.153	1.288	1.199	0.177	9.828