

Application of gis in tourism tourism essay



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Introduction:

Tourism is one of the most rapidly increasing business sectors in the world and the success of this business sector varies from country to country depending on different policies, ability to develop sufficient infrastructure to support, ability to manage and create market and overall marketing through the whole world about the product. Many of the countries depend on the tourism sector for their economic growth. To promote, plan, implement, manage and marketing, tourism are not easy task at any level of any country. There are lot of factors affect tourism in different ways. To maintain all aspects of tourism in a planned, sustained and economically sound way, computing and IT technologies facilities are necessary in this modern world. GIS- the special analytical tool can be helpful in tourism sector at different ways. GIS is now recognized widely as a valuable tool for managing, analysing, and displaying large volumes of diverse data to many different levels of planning activities. In case of tourism planning and management, GIS is using as a very useful tool.

Definitions:

It is important to understand Tourism and GIS clearly before discussing the application of GIS in tourism. Different segments of tourism require different types of data and analysis. In planning tourism, to develop tourism activities further, to discuss tourism prospect, to analysis tourist numbers, to market research GIS can be used differently. The definitions and some aspects of GIS and tourism are stated below briefly-

GIS:

Geographic Information System (GIS) is considered as significant science and analytical tool in the whole world for modern research and studies specially related to spatial data. Uses of GIS in the developed countries cover a wide range of areas whereas the developing countries are using this useful tool in some limited sectors due to lack of skilled staffs, enough funding and some other technical drawbacks.

Geographic Information System (GIS) is an analytical tool, originated from Computer Aided design (CAD) helps to create maps at different scales in different projections with a database to generate new information and present it in different formats (other than maps). It also creates links between spatial and tabular data and find out spatial relationships between the features of maps. It helps to collect, store and integrate spatial data to analyse and present them as new information. It is considered as a powerful tool to perform these works.

“ GIS is not a field by itself but rather the common ground between information processing and the many fields utilizing spatial analysis techniques” (Tomlinson, 1972).

“ GIS is computer-assisted systems for the capture, storage, retrieval, analysis, and display of spatial data” (Clark, 1986).

“ GIS is a powerful set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world” (Burrough, 1986).

Tourism:

Tourism is the activities of people during his leisure period, apart from his living, usual environment for a fixed period of time and performing some other activities. To promote, plan and implement tourism activities, spatial data are required as it depends on location, environment and some other factors.

The term tourist is derived from the word 'tour' meaning a journey at which one returns to the starting point; a circular trip for business, pleasure or education during which various places are visited and for which in itinerary is usually planned. (Murphy, 1985).

“Tourism is a composite of activities, facilities, services and industries that deliver a travel experience, that is, transportation, accommodation, eating and drinking establishments, entertainment, recreation, historical and cultural experiences, destination attractions, shopping and other services available to travelers away from home.” (Tourism and Leisure Committee, 1997)

The international national union of official travel organisations (IUOTO) in 1968 stated visitor as- any person visiting a country other than that in which he has his usual place of residence, for any reason other than following an occupation remunerated from within the country visited.

There is another term 'excursionists' is used as visitors but there are difference between tourist and excursionists.

Tourist- who are visitors making at least one over night stop in a country or region and staying for at least 24 hours.

Excursionists- who are visitors that do not make an over night stops but pass through the country or region. An excursionist stays for less than 24 hours and includes day-trippers and people on cruises.

According to Leiper, tourism is a system that consists three elements- the person who makes tour, geographical location or places that travelled during tour and the whole sector that controls the full system of tourism. The classification is given below:

Tourists- it means the persons or human who is making tour. That indicates the human who is the main actor of the full system.

Geographical elements- geographical location is classified three more classes-

traveller generating region- generating market for tourism, push to stimulate and motivate travel. Tourist search for information, bookings, departs.

tourists destination region- sharp end of tourism. Pull factors of tourism.

transit route region- not only the place of short period of stay to reach final destination but also intermediate places which may be visited (Cooper, et. al., 2005).

In this section push and pull factors have been stated where the push factors are those which influence people to travel such as holidays from work, meeting with relatives, education and business purposes and some time religious and medical purposes.

The pull factors are the attractive sites, museums, amusement parks, natural heritage sites and other attractive sites or festivals.

Tourism sector-

Tourism sector means the whole business sector and the whole organisation that supply different products for customers to attract. Here the products are tourist attractions and the customers are the tourists.

In some cases, tourism is defined as the full activities of a tourist person during his tour.

' From a conceptual point of view tourism is -the activities of a person travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes. (WTO and UNSTAT, 1994), (Cooper, et. al., 2005).

That means the tourism is a concept, means the activities of a travelling person. From starting point of the journey until it ends, tourism is there. When the person is back to his usual living environment, tourism ends for him. The whole activities (sight seeing, food, accommodation, shopping etc.) during the tour are considered as tourism.

There are some critical points to define tourist and tourism as it depends on the time duration or the total length of travel or tour. If the total travel time

or total length of travel is more than a year or less than a night it will not be accepted as a tourism activity.

Minimum length of stay- one night (visitors who do not stay overnight termed as same day visitors or excursionists); Maximum length of stay- one year.

One more point is involved to define tourism. That is distance. Distance from the usual living environment is considered. How far a traveller is moving from his usual environment is a question. World Tourism Organisation (WTO) suggests that if a person is travelling at least 160km away from his living environment will be considered as tourism.

Classification of tourists:

Depending on the criteria of tourists, their destination, purpose of travel, tourists are classified into different categories. The different categories of tourists have different choices, different destinations. So planning and implementing tourism for them and applying different tools for analysing tourism data varies.

Some classifications of tourists are given below:

Within scope of travel and tourism:

International- intercontinental, continental: persons who are travelling from one country to another. They are known as International Tourist.

Others: commuters, crews, students, migrants, and temporary workers.

Domestic- interregional, regional: persons who are travelling within the country but from one region to another. From example- travelling from London to Scotland.

Depending on the places (mostly international):

Inbound: tourists who are coming to a attractive destination are inbound tourist for that particular place. Example- a person is travelling to London from any region or any country. That person is inbound tourist for London.

Outbound: tourists who are going to another place or leaving a place are outbound tourists for the leaving place. Example-a person is travelling from London to any other region or country. He is outbound tourist for London.

Purposes:

Depending on the purposes of travel, tourists are classified as well. Some travel for business, some for religion, some for festivals, some to meet their relatives, some for education, some for excursion etc. Depending on the purposes of the tourists, their activities varies.

Motivators of travel:

In general there are some motivators for travelling. They are-War, religion, trade, discovery, festivals, health.

Elements need to attract tourist:

Only the purposes cannot influence people to make a tour. There are some elements which attract tourist for a particular location. The elements are-

Transport, technology, attractions, accommodation (with food), destination organiser.

Transport- this is the most important element to attract tourists. If there is lack of transport facilities, people will be less interested for travelling to that specific location. There are three modes of transport- land, water, air. Land transport consists of road and rail. Sometimes transport facilities themselves act as tourism specially in water and air transport.

Technology- from the international point of view, technology is very important for tourism. Absence of technology, discourage international tourism as there are limited connectivity and chance of being isolated during tourism. In this case, proper utility supply and specially telephone, mobile and internet connection are vital to attract international tourists.

Attractions- it indicates mainly natural and man-made attractions. Aesthetic beauty of a place, theme parks, monuments, sculptures, museums, sea beaches are important. Some places become attractive for tourism without having aesthetic beauty or any amusements. Religious places, historical places, archaeological sites are tourists attractions as well.

Accommodation-if the accommodation and food supply are not appropriate, tourism cannot sustain as tourists are not attract. During travel or tourism, tourists need proper food and rest. Without these the whole tourism may go in vein. On the other hand, some attractive hotels, some foods (special dishes-local or continental) are tourist attractions by themselves.

Destination organiser- destination organiser indicates the factors those are related to a tourist destination apart from the top elements. It includes the total system of a particular place, security, attitude of local people and over all how the whole tourism is managed there.

Factors affecting development of tourism:

There are two types of factors that affect the development of tourism. Micro and macro.

Macro factors: MACRO factors are the external factors of tourism. In short, they are known as PESTEL (Political, Economical, Social, Technological, Environmental, Legal).

Political- political factors indicates govt. attitude, political situation of the country, political stability the country etc.

Economic- this indicates the economic condition of the host country. Fiscal policy, economic growth etc. are included here.

Social- over all social condition, social structure, norms and social values, social culture, behavioural pattern of the host nation etc. are included in this sector.

Technological- use of technology, development of technology, accessibility of modern technologies(internet, mobile network, Wi-Fi, etc.) are the factors of tourism.

Environmental- natural calamities, eco-tourism, level of pollution, green environment, seasonal variation etc. are the environmental factors of tourism.

Legal- legal aspects towards tourists, legislative bindings, taxation rules, legal view towards tourists etc.

Micro: Micro factors are the internal factors of tourism. Supplier, distributor, stakeholder, shareholder, consumers, employees, competitors, public etc. are the micro factors of tourism.

Now a days, it is realized that Tourism is a way of conserving the environment, creating jobs and promoting more tourism. Tourism has the potential of becoming the highest generator of foreign currency.

GIS and Tourism:

GIS is used in tourism sector in different ways in the different countries. In general the most common use of GIS in tourism is location analysis and related to transport and accommodation. In general the following results can be achieved by queries in GIS Design and Application for Tourism:

Determination of important and necessary places for tourism.

Determination of historical and tourist places.

Determination of the best suitable hotel.

Determination of the optimum plan for sightseeing places

Determination of the shortest distance between the selected places

The use and application of GIS in the tourism sector can be divided into the following three categories:

- 1) Tourism planning
- 2) Tourism development and research
- 3) Tourism marketing

For tourism, one of the most important things is the local map of the tourist site. Map and GIS is closely related to each other. Maps with relevant spatial data can be produced with GIS. It can show the important features, attractive sites, possible routes of travel, location of hotels, restaurants, bars, shopping facilities with details. General information from this map and routes for travel can be used by tourists in selecting their destinations and further planning for travel and stay.

For tourism itinerary is also important. To create that GIS base map is also helpful.

Application of GIS in Tourism: Some examples-

In IRAN:

Esfahan Council of Tourism in IRAN investigated the use of GIS in Tourism Research in storing, manipulating and analyzing the voluminous tourism data and survey carried out.

To do this research, the Esfahan council of tourism in IRAN conducted some steps which are narrated shortly-

Network Analysis:

Generally a network is a set of linear features. Common examples of networks include highways, railways, city streets, rivers, transportation routes (e. g., transit, school buses, garbage collection, and mail delivery), and utility distribution systems (e. g., electricity, telephone, water supply, and sewage). For the Esfahan council, they use GIS to do network analysis in the linear features using vector model of GIS.

Network Allocation: One of the most important processes in the Planning and investment activities is network allocation. In other words, Network allocation is an analysis occurring at the same time of geographical entities and determination process.

Network Routing: Network routing determines the optimal path along a linear network. The selection of the path can be based on numerous criteria, such as shortest distance, fastest route, no left turns and minimum cost.

Network Tracing: Network tracing determines a particular path through the network

In the design phase, after selecting a place which is the most attractive spot for tourist, data process and physical design carried out with the help of ARC view 3. 2 with network analysis extension and ARC info. (www. esri. com).

Boundary maps, current maps, orthophotos, middle lines of roads and their name are used as graphical components of GIS Design and Application for Tourism in this case. Middle lines of roads which have vector and graphical characteristic for network analysis, and historical and tourism places and all

of the geographical objects considered as necessary items for tourism were designed as point layer. Only building layer was designed as polygon layer. Different layers for analysis has been used. There is general information on the entry requirements to the country, the climate, rules of the road and disease prevention.

ArcView network analyst is used to calculate the shortest route between places and generate directions. This is printed for the tourists which help them to find out their optimum destination. Distance between parks and hotels are also included and the easier route is also showing which help the tourists who are driving and using own transport.

From this further optimum planning is possible which will help to save time and money as well.

In GHANA:

GIS has the ability to perform spatial analysis. This ability has been used in GHANA as well. According to Daniel longmatey ' Simple analysis such as statistical summaries (minimums, maximums, means, and sums) and analysis of inter-relationships between various tourism related variables could be carried out in a GIS environment. For example, the data sets of historic monuments and roads could help solve the problem of finding all historic monuments along a primary road.'

In Ghana, GIS is used for cartographic development with the help of ESRI ARC Info and ARC GIS software. Labels and suitable graphic symbols were assigned to the various features for easy categorization, identification and

visualization. Facilities such as roads were also classified. A composite digital tourist map was thus produced.

With the digital tourist map a tourist can click on a particular location and that particular point will show the details of that location. Even the distance measurement, other suitable attractive places can be found in that digital tourist map.

Use of GIS technology for tourism planning offers a group of advantages in data documentation and processing that is found in Ghana-

Thematic cartography can be generated in a fast and inexpensive way.

Maps are produced in variable scales according to different kinds of users.

Information can be updated fast and easily.

To make applications with basic information and to produce new information through variable combination is faster and cheaper than crossing data in manual way.

They can show results in cartographic, statistical, or table form.

Errors can be corrected dynamically, saving the time and material that they would cost if corrections need to be done on printed maps or tables.

Cartography can be presented better and more accurately.

Information can be integrated easily, through automated relation between different databases that describe the same geographic space according to different themes.

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In Turkey:

The Tourism Information and Promotion System (TIPS) was developed in Turkey based on a GIS application. The three following entities can use the TIPS. They are-

Persons on any group of people travelling to Turkey

All travel agents

and

Tour operators

In this system, ' Digital Tourist Information Bank' and a detailed map established showing all major, secondary roads, and other roads that provide access to major historic and natural sites, political boundaries, all cities, significant settlements, historical and archaeological sites, National Parks, spas, tourism centres (sea sports, winter sports, etc.), ports of entry, and physical boundaries such as sea, lake, and river as separate layers.

With the ARC View Network analyst query and display the shortest distance and travel time between the specified origin and destination points are calculated as all the road segments are given distances in miles and kilometres, with road quality and level of service.

For example, a tourist who wants to go to Ephesus from Istanbul will enter the names of the two locations, either as a text or by clicking on the map, and the shortest and safest route will be displayed on the screen. Also , other places of interest and service areas along that route will be displayed,

showing more possibilities for stopovers. It is also planned to enter the names, addresses and telephone numbers of the coach services, airways, and railways(Adil, A. et. al.).

Site plans of important historic, natural sites, street maps of major cities are prepared in a digital format providing maps showing streets, location of museums, hotels, restaurants, convention centers, hospitals, train stations, metro stations, which allow address matching and network analysis.

ArcView GIS Network Analyst extension gives an opportunity to put together a full, comprehensive picture of the roads in terms of distance, time, shortest distance, cost, proximity to certain areas/points, road conditions, level of service, travel restrictions, etc. ArcView GIS provides a holistic view of layers, full information about the country, and access to wide variety of hotlinks such as text, image, sound, etc. (Adil, A. et. al.).

In Zimbabwe:

In Zimbabwe, GIS has been used to do market research for tourism.

Considering tourism as a business this research has been carried out. It was tried to find out the following queries using GIS in the tourism sector of Zimbabwe-

- _ Where customers are located

- _ The potential turnover of the business

- _ Where can further develop and how

For market growth and business development, it is necessary to know the location of the existing customers, the turn over point of the business and particularly which side is in perfect shape for further development at that particular time.

In Zulia state, Venezuela:

The Tourism Planning Geographic Information System (SIGTUR, abbreviation in Spanish) was established in 1997 by the six professors of the University of Zulia based on GIS.

SIGTUR use Esri ArcView GIS with Network Analyst extension and other with 3dAnalyst extension, to create complex thematic maps and on the other hand Esri ArcExplorer is used to support to consulting urban research activities. SIGTUR is based on three kind of process, combining automated commands and know-how operators knowledge (www. proceedings. esri. com):

1. Documentation. This process feeds GIS system with graphical and attributive information.

Recolection, by in-site registration, telephonic surveys and institutional information.

Systematization, ordering information according subsystem variables.

Transcription, digitizing.

2. Analysis. It use GIS capacities to calculate relation phenomena between urban variables.

Concentration, applying statistical analysis to count amount of units per vicinity or urban area.

Proximity, using buffers to calculate influence areas from punctual, lineal or polygonal attracting sites.

Accessibility, using network analyst to determinate best routes to interesting sites.

3. Results. It search the delimitation and qualification of potential tourism sites.

Direct final products-

Thematic maps by aspect, by screen or ready-to-print

Database reports, by search criteria or inventory outputs

Indirect sub-products

Digital maps, useful as consumables for another application.

From the above mentioned examples, application of GIS in tourism cannot be understand fully. There are many other ways of applying GIS in tourism sectors in many ways. If it is chalked out the application of GIS in tourism the following topics are found. Data entry, storage and manipulation, Map production, Database management, Data queries and searches, Spatial analysis, Spatial modeling, Decision support, Location, Condition, Routing, Identify most suitable locations for development, Measuring tourism impacts

at the different parts, Visitor management/flows, Analyze relationships ,
Assess potential impacts of tourism development etc.

Conclusion:

Tourism destinations are usually characterized by three different landscape features: points, lines, and polygons. Point features are individual tourist attractions, for example, a feature in a park, or a historic site along the highway. Coastal beaches and resorts often follow a linear pattern, while big theme parks or natural parks are characteristics of a polygon feature. These locational attributes are essential to a geographic information system. It is apparent that GIS has tremendous potential for application in tourism.

GIS has been applied in many disciplines including geography, forestry, urban planning, and environmental studies. Similarly, tourism is a subject related to geographers, economists, business, environmentalists, planners, anthropologists, and archaeologists. For that the potential for GIS applications in tourism is significant. Its use in environmental planning is rapidly increasing. Tourism is an activity highly dependent on environmental resources. Now eco-tourism is becoming more popular rather than traditional tourism. On the other hand, the strength of tourism planning can be enhanced by GIS applications. So as whole it can be said that GIS is a useful and efficient tool for sustainable tourism development and for tourism research as well.