

## APPLICATION OF GIS IN TOURISM MARKETING

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**ABSTRACT:** In the modern world where technology and information systems are a dire for every sectors improvement, the tourism industry can also not progress without them. Geographic Information Systems (GIS) helps identify where the potential resources are located, their distribution, information about them and their associated characteristics. Beyond providing cartographic applications, GIS plays an essential role in tourism comfort and effectiveness. For this study, two-weeks Global Positioning System (GPS) based survey was conducted in Rohri division of Sukkur district. Spatial and attribute data regarding potential tourism sites was collected to highlight tourism potential in the division. A spatial inventory of tourism spots was developed by making use of GPS data. In result of this study various thematic maps were developed for the tourists to identify the potential as well as unexplored tourism sites in the district with an aim to promote tourism.

**Keywords:** Tourism, Rohri Taluka, Geographic Information System, Global Positioning System

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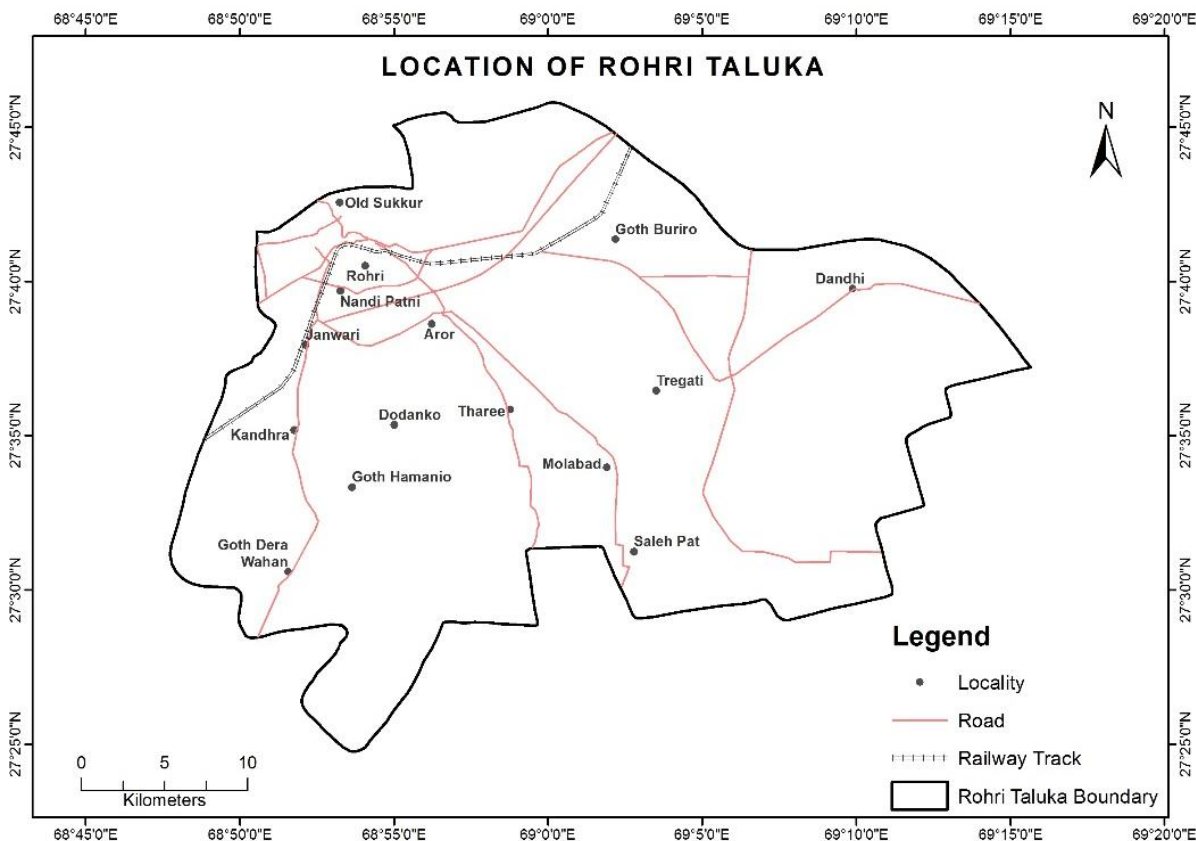
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### INTRODUCTION

Tourism has contributed 10.4% to the global GDP (WTO, 2018). The growth of tourism in Pakistan not only adds to economy but also helps create jobs and alleviate poverty (Sadruddin, 2011). Tourism improves the economic and cultural importance of the cultural sites. Pakistan was ranked among the top destinations for holiday and adventure tourism for 2020 by British Backpacker Society in 2019 (Fauzel *et al.*2021). Unfortunately, tourism industry suffered severely on the global scale, in response of COVID 19 pandemic (Uğur *et al.*,2020). In Pakistan too, the tourism activities were suspended for a few months but later resumed. Pandemic COVID 19 changed the trends and behaviors of life. Norms of social distancing and lockdown have led to digital surge. Everything has gone online including jobs, education, marketing, banking etc. In order to market a product, tourism industry also needs to follow the technologies.

Tourism in itself holds geographic characteristics and GIS can play vital role in decision making for effective tourism management and planning (Wei, 2012). With use of GIS applications like web apps and portals, the tourism product can be marketed efficiently that will not only help attract tourists but also guide them through travel. Integration of spatial elements in GIS tourism can enhance the marketing efforts (Bertazzon *et al.*,1997). Especially for the outbound tourists such applications can identify the tourism

potential. By making use of GIS maps depicting locations of tourist sites and basic facilities like hotels, banks, hospitals etc. tourists can easily navigate to their destinations. The web based online maps and GPS coordinates can help them plan their activities accordingly. GIS maps can be used in any form ranging from hard form paper maps to soft form mobile maps. GIS is not only restricted to cartography, it serves as a significant tool for analysis, decision making and predict scenarios (Ulmasova *et al.*,2011). The GIS application in tourism can be beneficial in many aspects such as tourism marketing, planning, development, facility management etc. (Verka and Angelina, 2008). Sindh province has plethora tourism sites, of which most of them have inadequate information for this scenario, to attract the tourists and to highlight the tourism potential within Rohri Taluka, Geographic Information System (GIS) was used. Rohri Taluka is one of the important administrative sub-division of Sukkur District, Sindh. It covers 1,040 Sq.km area with population of 371,104 (PBS, 2017). Rohri has significant historical importance and has served as busy trading port as well as agricultural hub in 1200's (Bowden, 2005), so there is plethora of heritage sites in the study area. All over the year Lansdowne bridge and Sadhu Bela temple attracts a huge number domestic tourists. But still there are most of cultural heritage sites within Rohri Taluka, which are unexplored or have been ignored by the tourists. The location map of the study area with geographic coordinates is show in the Figure.1.



**Figure 1. Location map of Study Area**

**MATERIALS AND METHODS**

An extensive survey of two weeks was conducted in the month of January, 2021; to get insight of the study area and record the tourism sites using Global Positioning System (GPS). During survey five main fields were covered keeping in view the tourist comfort, ease and safety. The five themes included location of religious and cultural heritage sites, location of banks & ATM's, fuel stations, police stations and medical facilities in the study area. It is necessary to store data collected from several possible sources which can serve as requirement for the tourists (Verka and Angelina, 2016). The data acquired was then compiled to develop a spatial database using ArcGIS software. Spatial database consists of geographic information, which differentiates it from conventional database (Ravada, 2003). GIS based thematic maps were developed by making use of the GPS coordinates. The maps incorporated basic information to like significant landmarks, road network, railway track etc. To denote every theme, point symbols were used to identify the location labeled with number. The attribute tables were also attached in the maps. The draft boundary of Rohri Taluka was digitized from Google Earth.

**RESULTS AND DISCUSSION**

GIS database is diverse and editable that can be updated with time. Spatial databases when uploaded on web portals, users can query to get required information about tourism site, basic facility or nearest route etc. In modern world online location based applications are used for navigation such as Google Maps API. Based on survey data tourism sites map was developed. Figure.2 shows the location of religious and cultural tourism in Rohri Taluka. It includes some of the ancient Mosques, temples and cultural sites along with unique bridges in the study area and so on. Such maps can help tourist plan their visits as per their interest.

The tourist influx puts pressure on various resources including water, electricity, greenhouse gases etc. On the other hand, hotels or tourist stay areas have a specific accommodation capacity. But if tourism destinations are managed properly these pressures can be balanced strategically (Li *et al.*,2019). The hotels and restaurants are the foremost requirement of tourists, where they can stay, eat lunch or dine out. There are several options of quality hotels and restaurants to choose from within the in study area (Figure.3). Hotels & Restaurants locations can help tourists to effectively manage and plan their visit.

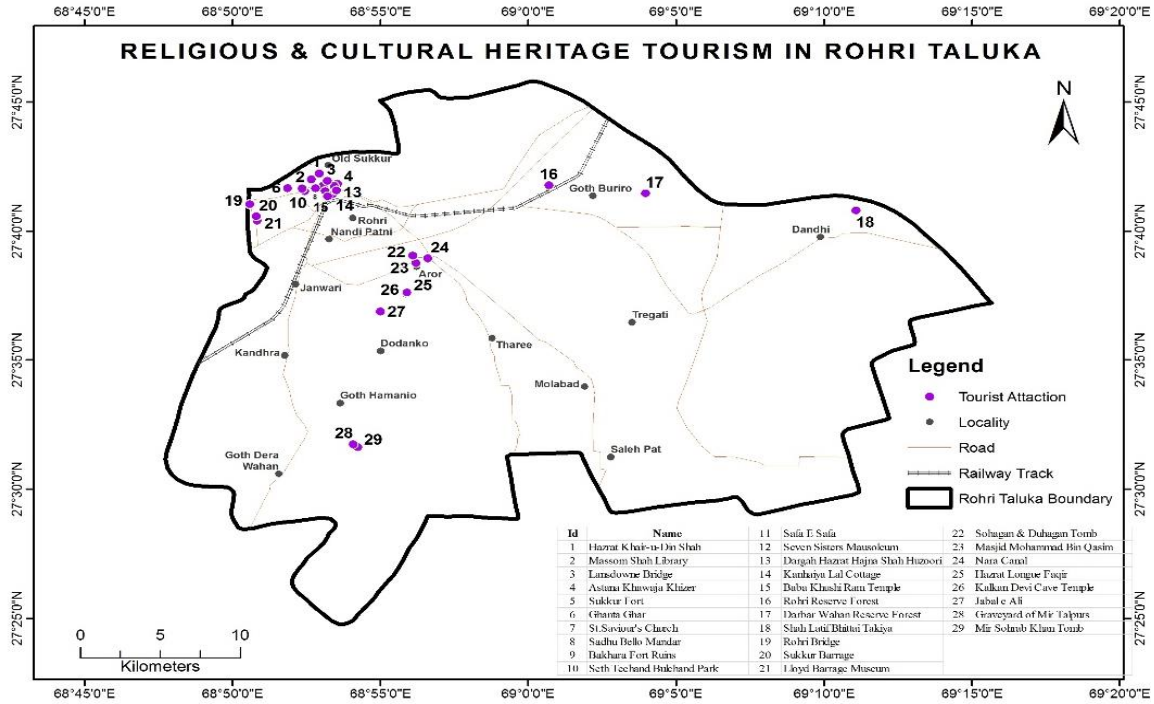


Figure 2. Tourism Sites in Rohri Taluka

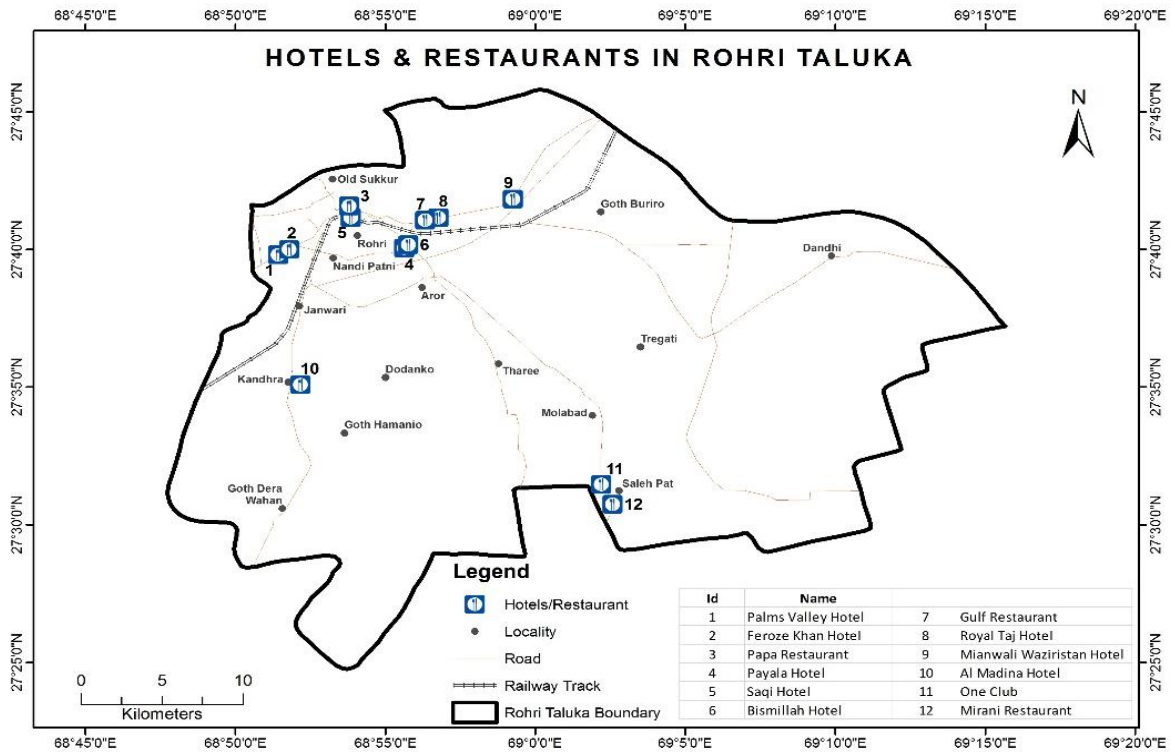


Figure 3. Hotels & Restaurants in Rohri Taluka

Over the recent years there have been advancements in the banking systems. In urge to compete in business, banks now provide online money debit and transfer services in the form of Automatic Teller Machine

(ATM). ATM centers are installed in the areas that are within reach of public (Fakhar and Haque, 2010). Availability of finance in form of cash is essential for the tourists, therefore it there is a dire need for them to know

where the banks or ATMs facilities are located. There are plenty of Banks or ATM facilities in the urban areas

where as only a few of such services are available in the rural area.

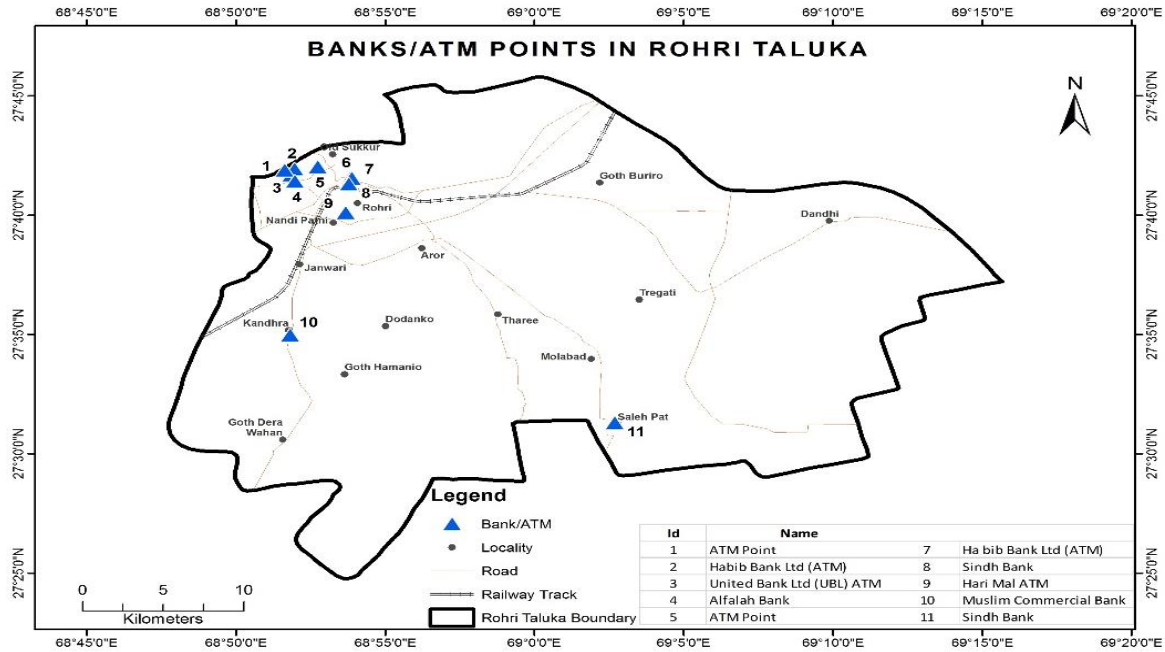


Figure 4. Banks/ATM location in Rohri Taluka

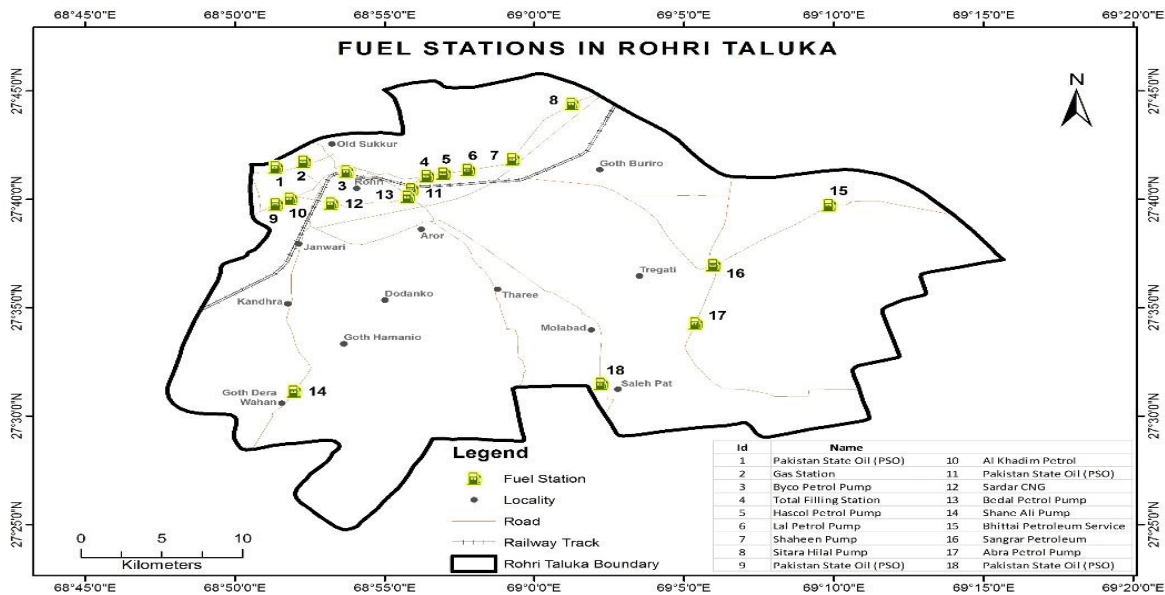


Figure 5. Location of Fuel Station in Rohri Taluka

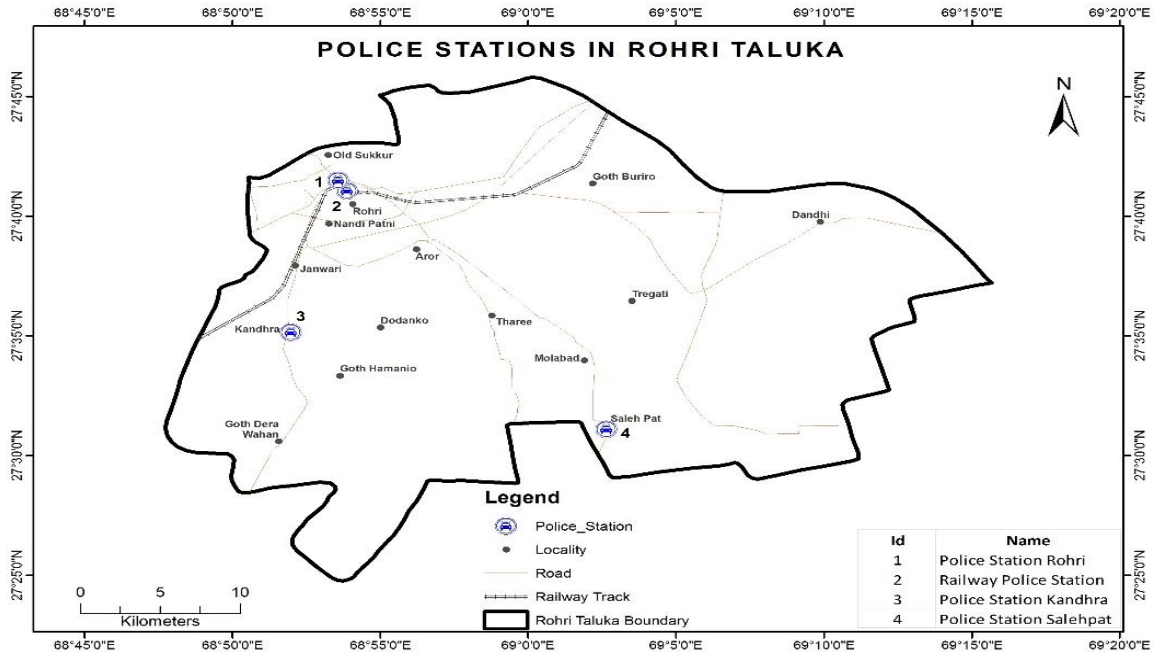
The security and safety are very major concerns in the tourism industry. These risks may range from white collar crime to terrorism. Tourism Managers or tour guides need to be fully aware of the tourist behavior (Walters *et al.*,2019). Criminal activities like drugs, trafficking and terrorism have been linked with this industry. The safety and wellness of tourists and tourism sites may put an end to tourism products. The tourism

planners must be in correspondence with the security services to ensure peace. The police stations or police facilitation centers makes sure safe travel, law enforcement and detecting. In case of emergency like any sort of crime or harassment etc. importance of police cannot be denied.

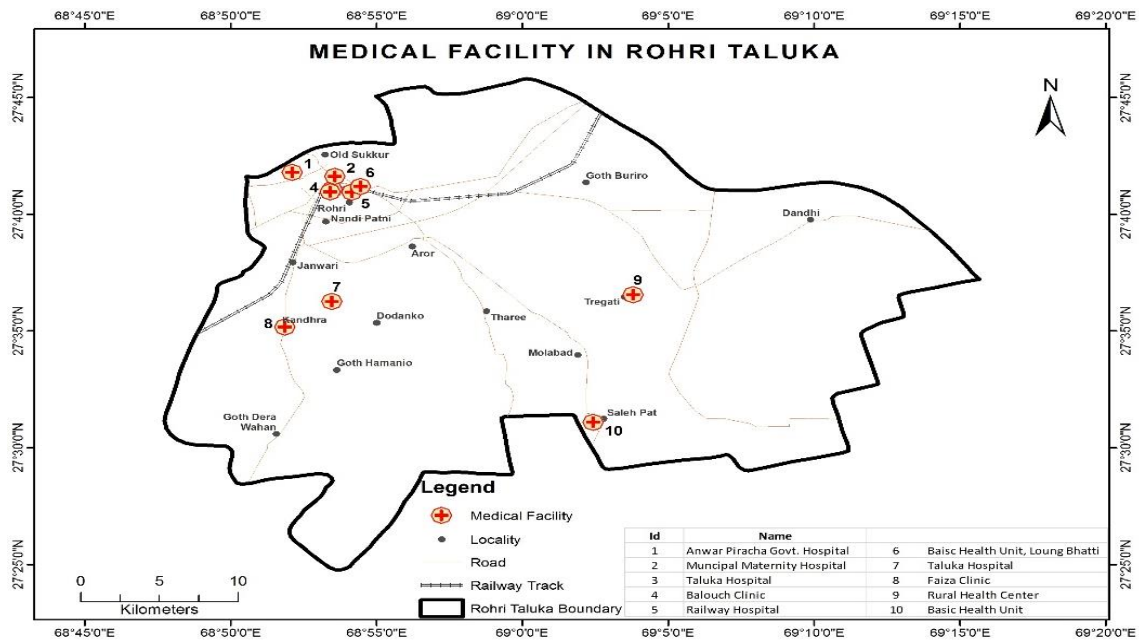
The transportation is a vital element in tourism, which alone is responsible for 75% of CO2 emission

(WTO, 2019). The well planned tourism makes use of available resources efficiently. Navigation systems help select the best suitable route to travel for all sorts of transport, which helps reduce traffic, fuel and saves time (Council. S. C, 2006). When tourists are clear what destination to reach, unnecessary resources will not be used. What so ever the means of transport may be, it depends upon fuel. The fuel stations either Gas stations or petrol pumps help tourists manage and plan their travel. There are several fuel stations in the study area.

The need of medical faculties have become a requirement with the wide spread of infectious and viral diseases. Tourist may also suffer from travel sickness which also adds to need of medical aid. Medical facilities in Rohri Taluka include hospitals, basic health units, dispensaries and clinics. In hour of medical emergency tourists need to have information about where medical facilities are present. During travelling tourists may encounter health issues due to hygiene or sanitation. (Baker, 2015).



**Figure 6. Police Station in Rohri Taluka**



**Figure 7. Medical Facilities in Rohri Taluka**

## Conclusion

The developed spatial database will support tourism in Rohri Taluka. With the passage of time the spatial database can be updated for the basic facilities for tourists. Tourism site services and facilities maps will not only help in navigation but also spatial analysis such as proximity and effective facility management. GIS applications can be very useful in promotion of tourism products. Introduction of unexplored tourism sites can help release the pressure on the overused sites and add adventure to the tourist experience. Beyond benefits, tourism also effects the environment in many ways such as depletion of natural resources, pollution. These issues can also be addressed to the public in form of web GIS portals and maps.

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