



RESEARCH ARTICLE

A STUDY ON THE TREND OF DEVELOPMENT ALONG THURAKAL BAPOOTY ROAD IN MANJERI,
KERALA USING GEOSPATIAL TECHNOLOGY

*Bindu, K. B., Neeraj Biju and Rishikesh Raveendhren

Department of Geography, H M College, Manjeri, Kerala

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ABSTRACT

The Thurakkal Bapooty bypass road is a link road connecting the Malappuram Manjeri road in south at Kacheripadi junction with Calicut Manjeri road in the western part of Manjeri town in Malappuram district in Kerala. It starts at Kacheripadi junction at latitude 11°6'37.728'' N and longitude 76°7'14.454'' E and ends near Thurakkal at latitude 11°7'16.008'' N and longitude 76°6'36.564'' E. The construction work of Thurakkal Bapooty road was started in the year 1996 and was open to the public in the year 2005. This road was constructed to divert the flow of vehicle traffic from the Manjeri town, in order to avoid traffic problem. Tremendous development is noted along this road within span of 10 years. The present study is focused on studying the trend of development in the study area along Thurakkal Bapooty bypass road using geospatial technology. This study is based on both primary and secondary data. The primary data in the form of questionnaire and direct interview was collected analyzed and mapped, similarly the survey map of wards was used to demarcate the outline boundary of study area. The Google Earth imageries of 2006 and 2016 were used to derive the land use pattern in the study area. The ArcGIS 10.1 software, Google Earth and Microsoft Excel was used for the collection, manipulation, analysis and representation of maps, tables and charts in this study. The study not only highlights the significance of Thurakkal Bapooty bypass road, but also reveals the trend of development and related major issues and problems in study area along Thurakkal Bapooty bypass road.

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INTRODUCTION

There are 15 State Highways passing through Malappuram district. Tirur-Malappuram-Manjeri Road, Valanchery-Perinthalmanna-Wandoor-Vadapuram Road, Pulamanthole - Nilambur Road and a portion of Calicut-Nilambur-Gudallur road from Valluvambur to Nadukani are the important State Highways pass through the district. The important District Roads in the districts are Tirur – Kadalundy Road, Thrikkalangode-Kalikavu Road, Kondotty-Areacode Road and Kondotty- Edavannappara Road. The above fact clearly states that among the major statutory towns, Manjeri municipality has a well developed transportation network. It is a collaboration of state highways & district highways linked with link roads which consists of minor roads connecting suburban areas with Manjeri. The roads connected at the center of town, are Tirur, Malappuram to Gudallur state highway, Calicut to Nilambur state highway, Manjeri to Pandikkad district highway & several number of other minor district roads. Besides these roads, there are four bypasses together

forming frontage or a ring road. They are CH Bypass, RajiveGandi bypass, Kacherippadi bypass and Payyanad Bypass. At present these link roads are the carrier roads spreading urbanization from Manjeri town to the peripheral areas. The present study is focused on one such link road called Kacherippadi Bypass road or also popularly known as Thurakkal Bapooty Bypass road serving as a link road connecting Malappuram Manjeri road at Kacheripaddi junction to main Calicut Manjeri state highway. The Thurakkal Bapooty Bypass road was established in the 1996, with an aim to divert the traffic from the main Manjeri town, in order to solve the growing traffic problems. In the initial stage, the Thurakkal Bapooty Road was used as a link road through which private and government owned state and interstate buses were allowed to pass. Later on with the establishment of the new private bus stand at Kacherippadi junction, this road gained its importance. From that time onwards there was a rapid change in the land utilization, economic activities and there started a rapid flow of traffic through this Thurakkal Bapooty Bypass road. In this present research work an effort is made to trace the trend of development along the Thurakkal Bapooty Bypass road during the span of 10 years, using Geospatial Technology.

*Corresponding author: Bindu, K. B.

Department of Geography, H M College, Manjeri, Kerala.

General introduction of Thurakkal Bapooty road

Even though the Manjeri town is well connected through road network, the small size of roads and lack of parking facility often causes traffic blocks. This is the major problem in Manjeri municipality since a long time. In order to solve this problem, several link road or otherwise called bypass roads were constructed to divert the flow of vehicle traffic from the Manjeri town, in order to avoid traffic problem. The Thurakkal Bapooty bypass road is laid down as a part of urban planning with main aim of solving traffic problem in Manjeri town area. The total length of Thurakkal Bapooty bypass road is 1 km which is two lane road of width 3.5 m. The total time taken to reach Calicut Manjeri road from Kacheripadi junction on vehicle in low traffic hours at a speed of 45 Km / Hour is 2 minutes 44 seconds. There is a gain of 2 minutes 2 seconds while traveling through Thurakkal Bapooty bypass road. This road is very profitable for the long distance travelers, good carriers, emergency services etc. There is frequent traffic block is observed in this road. This road is located very close to Manjeri town and urban expansion is clearly visible along this road. The Figure 1 shows the location of Thurakkal Bapooty bypass road, which is located in manjeri town of Malappuram district in Kerala state, India.

maps were georeferenced using ArcGIS 10.2 software. The study area covering the outer boundary of all the wards adjoining the Thurakkal Bapooty Bypass road in all direction was vectorized and stored in shapefile. Similarly separate shapefiles were created for deriving data regarding landuse from toposheet and Google satellite Images using ArcGIS 10.2 software. The landuse change analysis is carried out to understand the level of land use change in the study area during 2006 to 2016. The trend of development was analyzed and interpreted based on the field survey data using Microsoft Excel software. Based on the derived information about the trend and extent of development, its positive and negative impacts, suggestion are provided for proper development plan for the Thurakkal Bapooty Bypass road.

RESULTS AND DISCUSSION

The Figure 2 and Figure 3 show the land use pattern that existed in the study area along Thurakkal Bapooty bypass road in 2006 and 2016. The land use pattern is derived using Google Earth image of 2006 and 2016, at an eye altitude of 1614 feet. The land use was traced using polygon features, saved as KML file which were later exported to shapefile. After applying

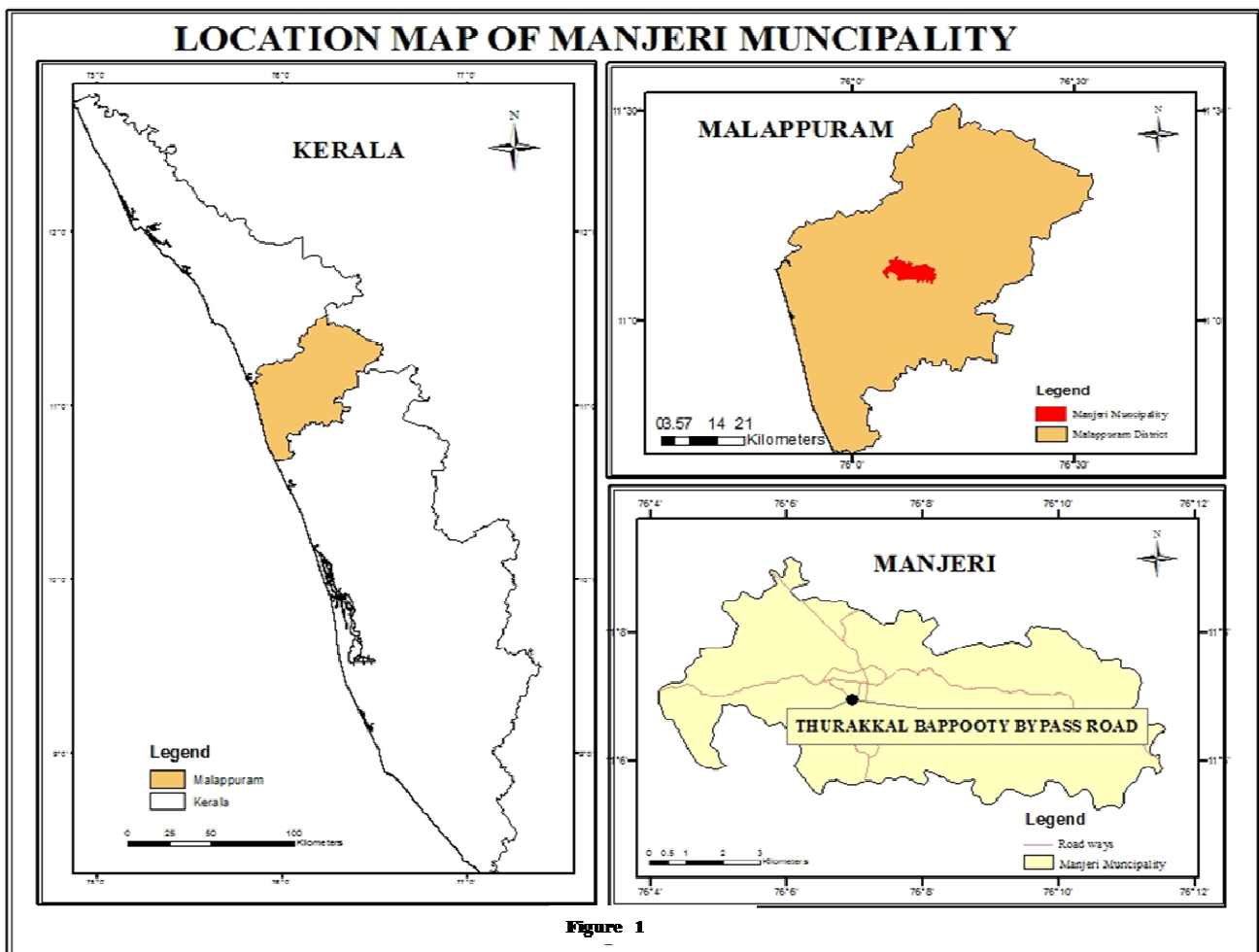


Figure 1

MATERIALS AND METHODS

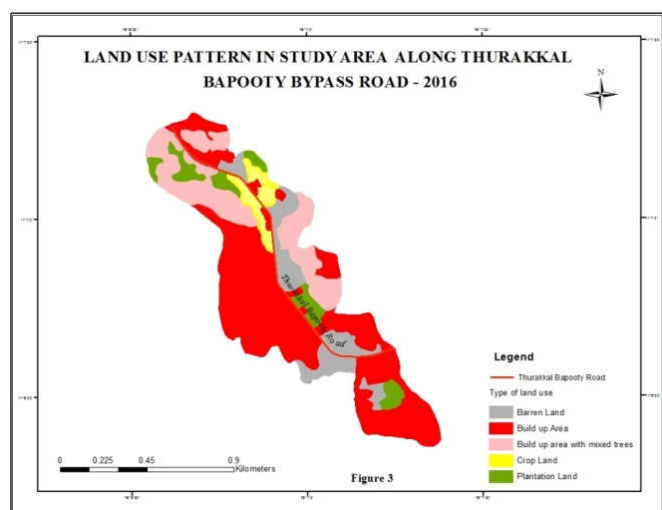
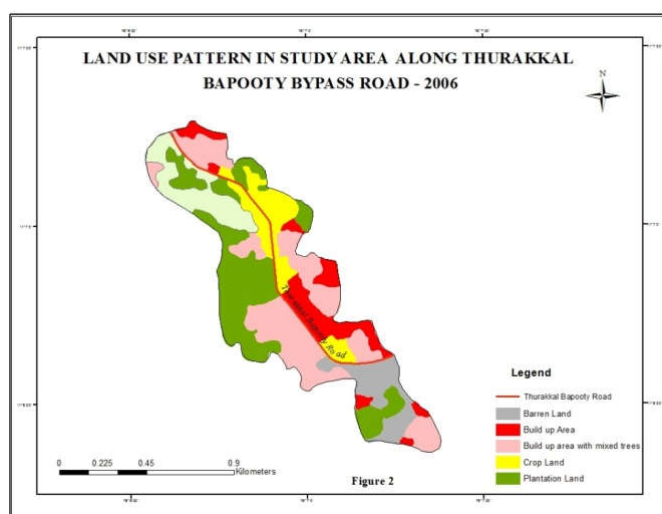
The base map was prepared from Survey of India toposheet of 58 A / 4 of scale 1: 50000. Initially the collected toposheet and survey maps were scanned and uploaded in ArcGIS 10.2 software. Later these scanned images of toposheets and survey

topological correction, the attribute data was assigned and thematic map was prepared using Arc GIS 10.1 software. As it is derived from Google Earth images, it is of less accuracy but can be visually and quantitatively analyzed. The Table 1 gives a detailed account of land use change that happened with a span of 10 years in the study area along Thurakkal Bapooty bypass road. This change was a result of opening of Thurakkal

Table 1. Land use change in study area along Thurakkal Bapooty bypass road – (2006 – 2016)

S.No.	Land Use Pattern	Land Use Pattern in 2006 in Hectare	Land Use Pattern in 2016 in Hectare	Land use Change (2006 – 2016)
1	Barren Land	7.80	12.67	4.87
2	Build up Area	10.38	45.54	35.16
3	Build up Area with mixed trees	33.54	17.23	-16.31
4	Crop Field	10.80	4.01	-6.79
5	Plantation Land	24.38	7.45	-16.93

Bapooty bypass road and change in land use activities etc. There were both positive and negative changes in land use pattern indicating increase and decrease in area under different land use type. In the study area along the Thurakkal Bapooty bypass road, within a span of 10 years (2006 – 2016), there was an increase of 35.16 hectare area under the build up area which included residential and commercial plots.

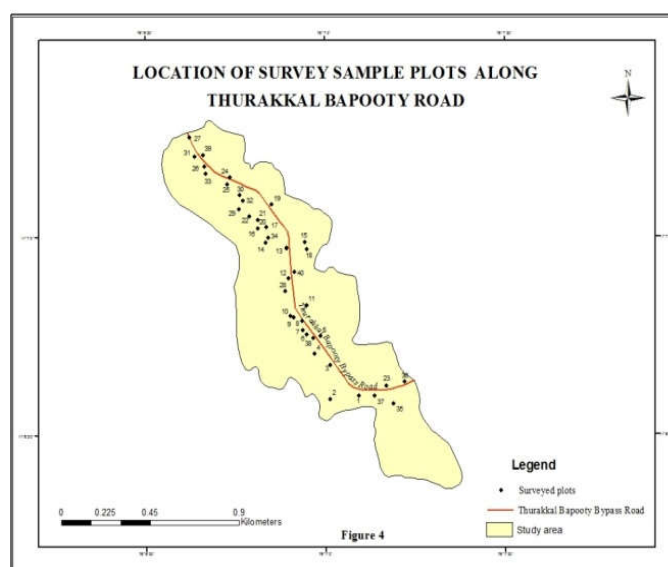


Similarly there was an increase of 4.87 hectare area under Barren land. There was decrease in area under build up area with mixed trees (- 16.31 hectare), plantation Land (-16.93 hectare) and in crop field (- 6.79 hectare).

Trend of development along thurakkal bapooty bypass road in 2016

A detailed study on the land use type and changes that happened in the study area along Thurakkal Bapooty bypass road highlights the fact that there was a drastic change in the land use pattern in the study area with large scale change of waste land into build up areas and reduction in crop field and

plantation area. This is mainly because this area became more accessible with the opening of Thurakkal Bapooty bypass road and since it connects with the state highway, commercial activities based institutes started functioning along this road. With the opening of Kacheripadi junction several commercial activities and business offices started at this place. Not only that there are several local roads interconnecting the places in between the Manjeri town, Industrial Estate road, Thurakkal Bapooty bypass road and Rajeev Gandhi bypass road. These also act as a reason of development in this area resulting in increased land value. In order to study the trend of development that occurred in this area a primary survey was conducted with the sample of 40 survey plots of different land use category located along the Thurakkal Bapooty bypass road. The Figure 4 shows the location of sample survey plots along Thurakkal Bapooty bypass road. The survey was conducted based on the questionnaire and direct interview of people in different survey plots. There are several types of survey plots included in this primary survey including residential, commercial, waste land, crop land and plantation area. People including owners of the survey plots, workers working in commercial shops, bus operators, bus drivers, local people, auto rickshaw drivers, lorry drivers and pedestrians were directly interviewed and based on their response the statistical analysis of gathered primary data was done using the Microsoft Excel software. The following paragraphs give a brief interpretation of the statistical data collected from the primary survey.



The Figure 5 represents the trend of land use change in sample survey plots along the Thurakkal Bapooty bypass road. It is to be highlighted that in 37 % of sample survey plots there was large scale change of land use from waste land to commercial land and this happened during a span of 20 years from the year 1995 to 2015. Secondly there was a change of waste land to residential land (32 %), which happened during the span of 29 years from the year 1982 to 2011. There was no change in

the land use plot before and after purchasing some sample survey plots which shares 23 % of the sample survey plots. Among these no change survey plots, 6 plots still remain as the residential land, in 2 survey plots still plantation is done and 1 survey plot is still a waste land. Based on the information gathered from the sample survey plots, it is clear that the majority of sample survey plots were initially waste lands which were later changed to commercial and residential land use. Similarly some waste lands were converted to religious land which shares 3 % of the total sample survey plots. 2 % of sample survey plots which were initially plantation land were converted to residential land and 3 % of survey plots which were initially residential plots were later converted into commercial land. Hence as the year passes, maximum areas along Thurakkal Bapooty bypass road are converted into commercial and residential area which indicates high preference of commercial activities based institutes to concentrate in this area in future.

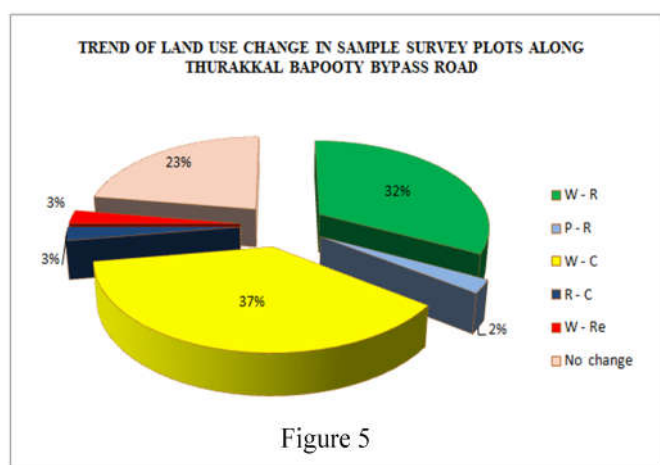


Figure 5

Note: W-R = Waste land to Residential, P-R = Plantation to Residential, W-C = Waste land to Commercial land, R-C = Residential to Commercial land, W-Re = Waste to Religious land.

A detailed study of land value gives a clear idea that there was a hike in the land value of area soon after the opening of Thurakkal Bapooty bypass road. Before opening of Thurakkal Bapooty bypass road the land value was fixed based on the type of land and as most of the land in this area were waste land the land value ranged between Rs 30000 per cent to Rs 50000 (before 1995), which later increased to average cost of Rs 200000 per cent (after 2005) and at present the land value irrespective of type of land ranges between Rs 2000000 per cent to 3200000 per cent (2016). Along the Thurakkal Bapooty bypass road, fragmented land holdings are found which ranges between 10 to 20 cent on average. Among the sample survey plots, 62.5 % of survey plots are under private ownership which include residential plots, plantation plots and few commercial plots, 35 % of survey plots are owned by private companies which include commercial plots and only 2.5 % of survey plots are under public ownership, which includes Indira Gandhi Bus Terminal (IGBT). This statistical figure clearly highlights that as most of the land is under private ownership, the land use pattern will be drastically changed in the coming years based on the hike in land value and concentration of commercial activities in this area. Based on the response of owners of sample survey plots, it was understood that majority of the people purchased land in this area because of the easy accessibility through Thurakkal Bapooty bypass road, some found it more suitable for commercial purpose and few likes to build home as it is calm area and away from town. Among the

people interviewed from sample survey plots 92.5 % people are satisfied with the existing facilities in their area and are not interested to move away from this place where as only 7.5 % people are interested to move away from this area provided they receive high land value. A review of their response highlights that if this trend of development continues in future, more than the advantages, the disadvantages are going to be the major concern regarding the Thurakkal Bapooty bypass road. It is of no doubt that in the coming years, along Thurakkal Bapooty bypass road, there will be drastic change in the land use activities, high increase in land value, high concentration of commercial activities, high rate of traffic flow etc, but if not properly planned, simultaneously this area will also face the same traffic problems as it exist now in the Manjeri town. Hence a detail study was also carried out to study the existing traffic and environmental problems along Thurakkal Bapooty bypass road.

Conclusion

In the present research work an attempt has been made to geospatially analyze the trend of development along the Thurakkal Bapooty bypass road, near Manjeri town in Malappuram district. The Thurakkal Bapooty bypass road plays an important role in traffic flow, in and out Manjeri town. With the opening of Indira Gandhi Bus Terminal near Kacheripadi junction, the Thurakkal Bapooty bypass gain its significance. Since the Thurakkal Bapooty bypass road is easily accessible from all direction and as it is very close to the Manjeri town, the area along this road is at present becoming a commercial hub holding several commercial activities. A detailed study of the land use pattern within a span of 10 years from the year 2006 to 2016 based on the data derived from Google Earth imageries, highlights the fact that there was a drastic change in land use pattern, with a high increase in build up area and slight increase in the area under barren land. At the same time there was a decrease in area under build up area with mixed trees, plantation and crop land. From the direct interview of land owners, local people, bus operators, lorry drivers, auto rickshaw drivers, bus drivers, traffic police, pedestrians and local people, it was realized that Thurakkal Bapooty bypass road has both positive and negative influence on the study area along the Thurakkal Bapooty bypass road. This research work can be used as a resource for various studies related to the urban morphology, road network analysis, land use management plan in Manjeri municipality.

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