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ASSESSMENT OF THE STATUS OF ORGANIC RETAIL STORE IN CHENNAI - A GEOSPATIAL TECHNIQUE

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ABSTRACT

    Most of the urban population is currently facing serious health issues. The demand for organic food products is growing in India, especially in Tier I cities like Mumbai, Delhi, Chennai, Bangalore, Gurgaon and Pune. Therefore, it is very important to know the present status of organic store location. For conducting this research, a remote-sensing technique Google Earth was coupled with Geographic Information System(GIS) and Microsoft Excel to locate all the organic retail stores in one of the Tier I cities namely Chennai city. More number of organic retail stores are observed in zone XIII (Adyar) followed by zone IX (Teynapet) and zone VIII (Anna Nagar). Hence, Satellite survey is very useful to find out the current organic retail stores before studying the consumption attitude of organic retail stores.

KEYWORDS: *organic food products , Geographic Information System(GIS) , modern agricultural practices.*

1. INTRODUTION

    The unsustainability of modern agricultural practices has led the farming communities world over to look for alternatives. A majority of these alternatives indicate a return to the traditional, eco-friendly practices; organic farming is one among them. According to recent FiBL survey (2017) number of countries practiced organic agriculture have increased 77 in 1999 to   179 countries in 2015 (Willer and Lernoud, 2017). Its share of agricultural land continues to grow in many countries and according to the latest survey, worldwide, almost 50.9 million hectares of agricultural land is managed organically (Willer&Lernoud, 2017). Most of this land is in Oceanic followed by Europe, Latin America, Asia, North America and Africa. The total organic area in Asia is almost 4 million hectares, managed by almost1, 30,000farms(Willer&Lernoud, 2017).). Currently,India's total area under organic certification is 4.72 million hectare in 2013–2014, and globally, India ranks tenth Deshmukhand and NitinBarbar(2015)studied present status and prospects of organic farming in India.

    India is the second highest populated country in the world with an urban population of 377.1 million in the year 2011. The demand for organic food products is growing in Tier I cities such as Mumbai, Delhi, Chennai, Bangalore, Gurgaon and Pune, due to high purchasing power and huge presence of health conscious consumers. This phenomenon finds its expression in the increasing popularity of farmers markets, organic bazaars and community supported agriculture. Organic food usually costs up to 20% to 30% more than conventional food items, which is one of the major challenges in Indian markets, as a majority of the consumers are price sensitive. The rapid growth in demand and production of organic food necessitates continuous research in order to document and understand the evolution of these retail markets. It is very important to know the present organic stores in one of the tier I cities that are Chennai. To know the present location of organic retail stores it is very essential to accurately locate using a remote sensing satellite. This is possible by geo-referencing the location of organic stores by satellite imagery.

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The advent of new mapping technologies such as Google Earth that offers free satellite imagery, easy to use program owned by GoogleInc. that allows access to sub meter pixel resolution data for over a quarter of the world's landmass and three quarters of the global population (Google 2014).Google Earth provides high-resolution data that are used as a platform for validating datasets(Fritz et al. 2011) used previously with urban extent (Schneider et al. 2009). While Google Earth has the potential for wider use in scientific literature particularly in retailer marketing analyses(Schneider et al. 2014) the high resolution is adequate to identify individual buildings in urban areas(Hu et al. 2013).One prominent challenge is that Google Earth still lacks in the analysis function and this can done GIS software. GIS software is commonly used for analysis of geographical data and information. Retail planners are faced today with many issues that can be handled with GIS. Today, GIS can be used as a retail planning application to answer the following analytical questions: Where to open a new store? Which stores are under performing? What is their market share and penetration? How many potential customers live within 10 miles of the store? How many competitors are located within the market area of the store? And where should a new store be located in order to minimize the impact it has on the current location of the stores?(Murad 2007). GIS-based approaches have been used to study the suitable location selection for shopping centres (Cheng et al. 2007; Gundogdu, 2011; Gundogdu,2013) retail facilities planning in Jeddah city (Murad 2011), transformation of shopping centres into private urban public space in Izmir,Turkey(MalikeOzsoy 2010) retail location analysis (NitiDuggal 2007).This shows the effective use of GIS in retail marketing.

A remote sensing technique was developed which combines a Google Earth,GIS and Microsoft Excel to identify organic store location for Chennai city.

2. METHODOLOGY
2.1 STUDY AREA

Chennai, the capital of Tamil Naduand is the fourth largest metropolitan city of India. Chennai corporation area is located on the southeast coast of India and in the northeast corner of Tamil Nadu. It is located on the flat, Eastern coastal plainsand the city has an average elevation of 6 m(meters). The city stretches along the coast covering about 43km of sandy beach and extending about 19km inland, encompassing an area of 426sq km. The city was classified into three regions: North Chennai, Central Chennai and South Chennai. Further the city foradministrative purpose it was divided into 15 zones, consisting of 200 wards.

2.2 THE CURRENT STATUS OF ORGANIC RETAIL STORES IN CHENNAI

Chennai is the most populous and economically significant city in Tamil Nadu. It is the 34th economically developed city in the world.From thepopulation perspective, it has the population 4,681,087In this research first of all, the number of existing organicretail stores and their distribution (geographical location) was determined based on satellite images on Google Earth and coupled with GIS for further analysis. The methodology to locate the existing organic retail stores is shown in Figure 1.
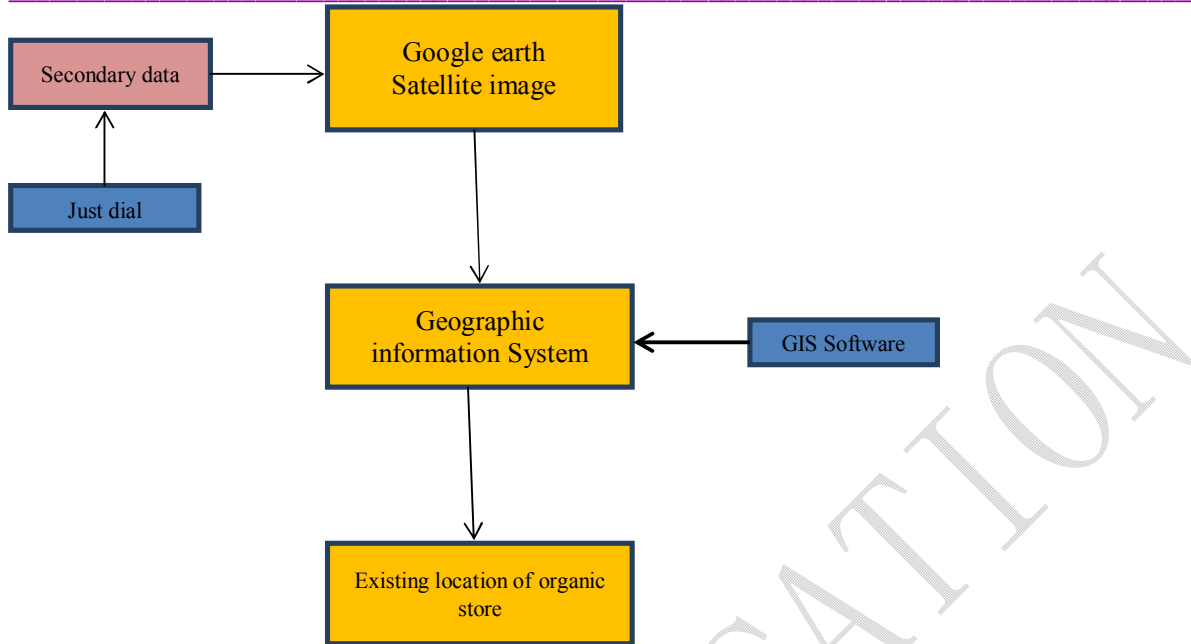
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Figure 1 Methodology to show Google Earth coupled with GIS

2.3 DIGITIZATION OF GREATER CHENNAI BOUNDARY

The corporation boundary of Chennai was downloaded from Chennai metropolitan development authority(CMDA) website in JPEG format and the information about road intersection, railway crossings were considered during image-to-image registration. Theboundary is shown in Figure 2. The boundary of the Chennai Corporation is digitized and has been converted from ArcGIS shape file format (.shp) to Google Earth compatible format (.kml) and was opened on Google Earth to define the boundary limit.
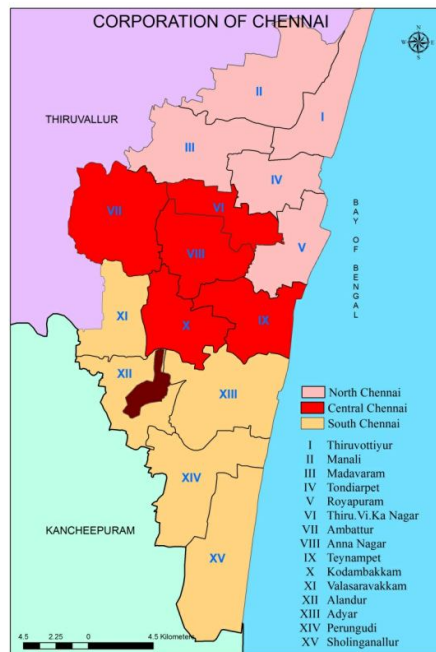

Figure2 Digitized boundary of Greater Chennai Corporation

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2.4 APPLICATION OF GOOGLE EARTH

Google Earth is virtual globe software, which was first launched by Google Company in 2005. Users can get free high-resolution satellite images around the world through Google Earth. Google Earth, maps are embedded with additional information on terrain, street and road names, famous landmarks and buildings information. Retailer studies have tapped into the power of Google Earthsatellite technology for research purposes. Satellite survey is doneto find out the current organic retail storesbefore studying purchasing and consumption pattern of organic product. The organic retail storeswere collected from secondary data (Justdial) with address, then mapped using pushpins on Google Earth within Chennai boundary.

2.5 GOOGLE EARTH COUPLED WITH GEOGRAPHIC INFORMATION SYSTEM (GIS)

The GIS technology is appropriate for a variety of usages including resource management, land surveying and business planning. The current paper presents an application of Google Earth coupled with GIS for locating the existing organic retail stores and their analysis.

3. RESULT AND DISCUSSION

The number of the existing organic retail stores and their geographical location was determined based on satellite images on Google Earth.

Overall zone XIII (Adyar) have more number of organic retail stores followed by zone IX (Teynapet), zone VIII (Anna Nagar) andKodabakkam . Zone I, II, III and V has very less organic retail stores. It is observed that the geographical distribution of organic store in Chennai is tied with the road network.

From the Figure 3 it is observed that organic retail stores are almost saturated in dense population area. Greater Chennai Corporation is divided into three regions, namely north Chennai, Central Chennai and South Chennai. More number of organicretail storesis located in Central Chennai, followed by South Chennai and North Chennai.
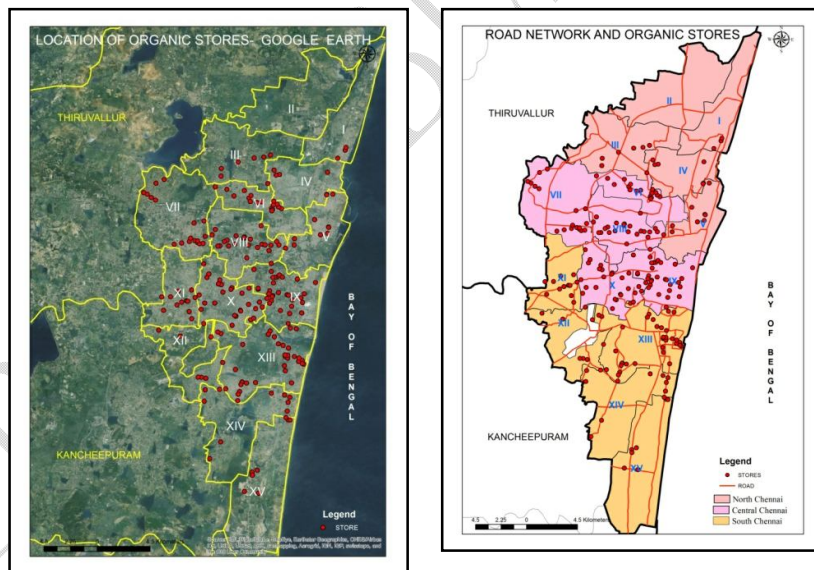

Figure3(a) Location of organic stores on Google Earth (b) Organic stores tied with road networks

3.1 NORTH CHENNAI

North Chennai is a part of Chennai city, situated on the north of the Coovum River. North Chennai has less number of organic retail stores, and is generally considered an area of stagnant growth that has already reached saturation as a real estate choice . The area is notorious for its thick population, narrow roads and poor infrastructure. Very few organic retail stores were observed in North Chennai comprising

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zone1 (Thiruvottiyur), II (Manali), III (Madavaram), IV (Tondiarpet) and V (Royapuram). North Chennai is mostly populated by medium-income groups.Although thereal estate sector growth has been driven by the Information Technology sector in South Chennai,but it has not spread tonorth Chennai. However, there has been increasing industrial activity in the past few years, beginning from Ponneri and the extended suburbs of north Chennai.

3.2 CENTRAL CHENNAI

Central Chennai lies between the Coovum River and the Adyarriver and various zone. This region is largely populated by the upper class and upper-middle class. Central Chennai coversRoyapettah, Chepauk,Teynampet, Alwarpet, Mylapore, Triplicane, Mandeveli, Nungambakkam, Kodambakkam, Vadapalani, Virugambakkam, Valasaravakkam, T.Nagar, Nandanam and Saidapet.Central Chennai is made of old and well-established residential and is mostly overlooked by IT companies due to scarcity vacant land and high real estate prices. More number of organic markets are found in Zone IX (Teynampet) followed by Zone X (Kodambakkam), Zone VIII (Anna Nagar), VII (Ambattur) and VI (Thiru Vi-Ka Nagar).

3.3 SOUTH CHENNAI

Southern part of Chennai is fragmented into small localities, which are mostly residential areas and commercial centres. Created early in 1957, South Chennai is the oldest part of the city.Adyaris located on the banks of the river Adyar and was initially a residential area. Large number of organic stores are observed in zone XIII, which consists of Adyar, Guindy, Velachery, Thiruvanmiyur and Raja Annamalaipuram. Today it is the most developed region of the city due to the establishment of a number of IT companies.

4.CONCLUSION

This research paper describes a method that utilizes GIS andGoogle Earth to map the location of organic stores. To fulfil this need rationally, the qualities of the target population and their consumer behaviour must be analyzed. Areas of high retail stores densitywerechosen to facilitate timely interviews and access. We suggest that future studies in the region could involve more qualitative investigations of the price and quality of food. Acase study can performed in Adayar and Anna Nagar areas,based on the findings of this research.

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