Land use Change Detections Due to Sriperumbudur SEZ in Nearby Villages Using GIS

S.R. Masilamani[1], Sudharsanamurthy.P[2]

[1](Department of Planning, SAP Campus, Anna University, India)
[2](Department of Planning, SAP Campus, Anna University, India)

Abstract: The number of special economic zone (SEZs) globally continues to expand. SEZs account for an increase share of international trade flows and employ growing number of workers world-wide. In the global economic, EPZs are viewed as an important if a second best policy instrument to promote industrialisation, generate employment, and for regional development. However, costs and benefits of SEZs have generate intense debate, touching on almost every aspect of SEZs. Therefore, SEZs are beneficial for development remains a subject of controversy. Aim of the paper is to access the Land Use Change in and around Special Economic zone of Sriperumbudur SEZ. About Eight villages in and around Sriperumbudur SEZ comes under the study area. The land use Change in these villages was studied before and after establishment of SEZ.

Keywords: Impact Analysis, Land Use, Special Economical Zone, Change Detection

I. INTRODUCTION

According to Shaban (2005) faced with grim economic and financial situation, the government of India started liberalizing, globalizing and opening up the economy for private sector participation in the earlier 1990s. Since then, notwithstanding the changes in the ruling parties, the liberalization and opening up the economy is going on in phased manner. It is that given greater economic efficiency, the private sector would not only help to increase the rate of economic growth in the country but also lessen the economic and financial liabilities and burdens of the government.

Since the liberalization the GDP growth rate in the country has been relatively much higher than prior to liberalization years. India has emerged as one of the major players in the world economic area and is attaching sizeable amount of foreign capital in the country. Finding more economic space, many private sector, companies and MNCs have taken up\set up their projects at places having location advantage. Many capital intensive project in the heavy engineering, steel power generation, fertilizer, infra structure development and etc, have also been taken up.

Special Economic Zone is a geographical region that has economic laws that are more liberal then a country's typical economic laws and SEZ is a trade capacity development tool, with a goal to promote rapid economic growth by using tax and business incentives to attract foreign investment and technologies today, there are approximately 3000 SEZs operating in 120 countries, which account for over US $ 600 billion in export and about 50 billion jobs. By offering privileged terms, SEZs attract investment and foreign exchange spur employment and boost the development of improved technologies and infra structure.

More over SEZs provide a medium wherein it not only attached in foreign companies looking for cheaper and efficient location to set up their offshore business, but it also allow the local industries to improve their exports through a proper channel and with the help of the new partner to the outside world at a very competitive praise. SEZs offer relaxed tax and tariff policies which are different from the other economic areas in the country. Duty free import of raw material for production is one example. Moreover the free trade zones attract with players who want to set up business without any license hassles and the long process involved in it.

Most of the allotment is done through a single window system and which is highly transparent system. The bottom line therefore is increased export and FDI (foreign direct investment) enabling increased public-private partnership and ultimate resulting in a development of world class infra structure, boost economic growth, export and employment.

Establishment of SEZ in an area, would have a greater impact on all aspects, but mainly the change in land use. The land use pattern will undergo a dramatic change like agriculture to industries and residential, affecting people and environment. Therefore, it becomes a prerequisite to gauge the possible impact by SEZs; it will help to address the issues of rehabilitation, resettlement and environment systematically.

II. SPECIAL ECONOMIC ZONE AND CASE STUDY AREA

SEZ means Special Economic Zone, the main idea of SEZ is to promote Economic development and create employment opportunities. As of 2015 there are about 1071 SEZ located in India till 2015, Tamil Nadu

holds about 13.63% of total SEZ which is 146 and it stand in the fourth place next to Maharastra, Telangana and Karnataka.

Table: 1 Area Wise Distribution of SEZ

Name	Total Area in Sq. km	Total Area SEZ in Sq. km	Percentage
Maharashtra	307713	374.698	0.121
Andhra Pradesh & Telangana	275608	222	0.08
Tamil Nadu	130058	23.24	0.202
Kanchipuram	4393.37	26.61	0.006
Sriperumbudur	935.67	7.43	0.794

Source: http://www.sezindia.nic.in

The above Table.1 shows the comparison of percentage of area of SEZ in Maharashtra, Andhra Pradesh, Telangana and Tamil Nadu. Then the percentage of SEZ in Kanchipuram and Sriperumbudur given in the Table.1. About 0.8% of land in Sriperumbudur is under SEZ, which is greater than State SEZ land Area.

Sriperumbudur SEZ is located in Sriperumbudur Taluk in Kanchipuram District which is located NH4 from Chennai to Bangalore at 45 km from Chennai. The nearest Airport is located at Chennai, nearest railway station are Avadi and Thiruninravur and nearest port is Chennai Port. Sriperumbudur SEZ which is present in Sriperumbudur SIPCOT the land has been acquired in 1998; total area of land is 2108.54 Acres.

The villages which are covered under the Sriperumbudur SEZ are Mambakkam, Araneri, Thiruninravur. Sriperumbudur SEZ was proposed in 2000, the preferable industries in Sriperumbudur SEZ are Plastic, Automobile, Engineering and Chemical Industries. Water is supplied to the industries by SIPCOT water supply scheme, power is supplied through Tamil Nadu Electricity Board. NH4 is the major corridor running from Chennai to Mumbai has an advantage of locating the SEZ. The Sriperumbudur SEZ creates about 5000 Employment opportunities.

There are seven villages, which has been selected as case study area. They are namely Mambakkam, Araneri, Pondur, Sirumangadu, Vadamangalam, Thirumangalam and Irungulam. The Sriperumbudur town which is located at 9 km from Sriperumbudur SEZ is also taken as case study area, since the town will have a greater impact on its infrastructure facilities.

The villages Mambakkam, Araneri, and Thirumangalam are selected as they are the part of Sriperumbudur SEZ. The Other villages like Pondur, Sirumangadu, Vadamangalam are located adjacent to SEZ are considered since their growth is accelerated due to the SEZ.

III.   CHANGE OF LAND USE IN STUDY AREA.

The Change in Land Use is identified using Satellite imagery of 2001 & 2016, with the help of GIS. The cross checks were done using ground Verification.

The detailed methodology was worked out to study the Change in land use in the Study areas are given below.
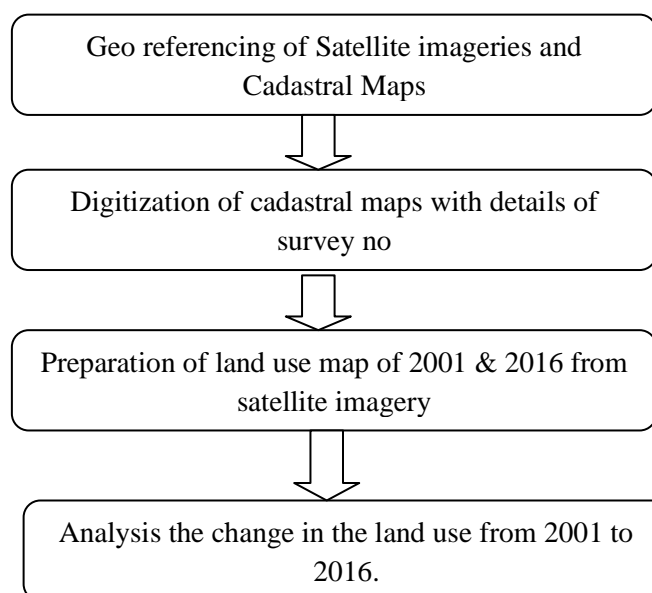

Fig. 1 Methodology

The Satellite imagery for the year 2001 & 2016 were Georeferenced and the Cadastral Map for the villages in the study area were also Georefrenced. Then the cadastral details were digitized using Arc GIS, and the required attributes were created. The land use map for the year 2001 and 2016 were prepared using Satellite Imagery. Then the change in the Land use were analysed and tabulated as shown in the Table.2.

Table 2. Change in Land Use of Case Study Area

| Village Name	Year of Analysis	Total Area in Sq.km	Agriculture	Commercial	Industrial	Institutional	Residential	Road	Vacant Land	Water body
Sriperumbudur	2001		12.465	0.000	0.179	0.114	1.308	0.530	2.183	3.840
	2016	20.618	8.685	0.454	0.749	0.224	4.305	0.534	1.649	4.019
Mambakkam	2001		4.630	0.000	0.000	0.000	1.244	0.258	1.052	1.213
	2016	8.397	2.113	0.005	3.181	0.000	1.113	0.342	1.157	0.485
Pondur	2001		6.286	0.000	0.000	0.000	0.192	0.153	0.000	1.183
	2016	7.815	2.709	0.000	2.868	0.000	0.548	0.270	0.563	0.857
Araneri	2001		1.549	0.000	0.000	0.000	0.145	0.023	0.000	0.522
	2016	2.239	0.136	0.000	0.416	0.000	0.202	0.024	1.220	0.241
Thirumangalam	2001		2.587	0.000	0.000	0.000	0.373	0.267	0.484	0.562
	2016	4.272	1.719	0.000	0.950	0.000	0.611	0.313	0.274	0.405
Vadamangalam	2001		3.095	0.000	0.133	0.000	0.220	0.029	0.339	0.482
	2016	4.298	1.589	0.000	1.152	0.000	0.326	0.029	0.730	0.472
Sirumangadu	2001		1.734	0.000	0.000	0.000	0.106	0.001	0.061	0.528
	2016	2.430	0.756	0.000	0.917	0.000	0.108	0.084	0.131	0.435
Irungulam	2001		0.462	0.000	0.000	0.000	0.074	0.049	0.000	0.133
	2016	0.719	0.000	0.000	0.474	0.000	0.000	0.052	0.082	0.110
Total Area	**2001**		**32.808**	**0.000**	**0.312**	**0.114**	**3.662**	**1.309**	**4.120**	**8.463**
	2016	**50.788**	**17.705**	**0.460**	**10.707**	**0.224**	**7.213**	**1.647**	**5.806**	**7.025**

Source: Primary survey
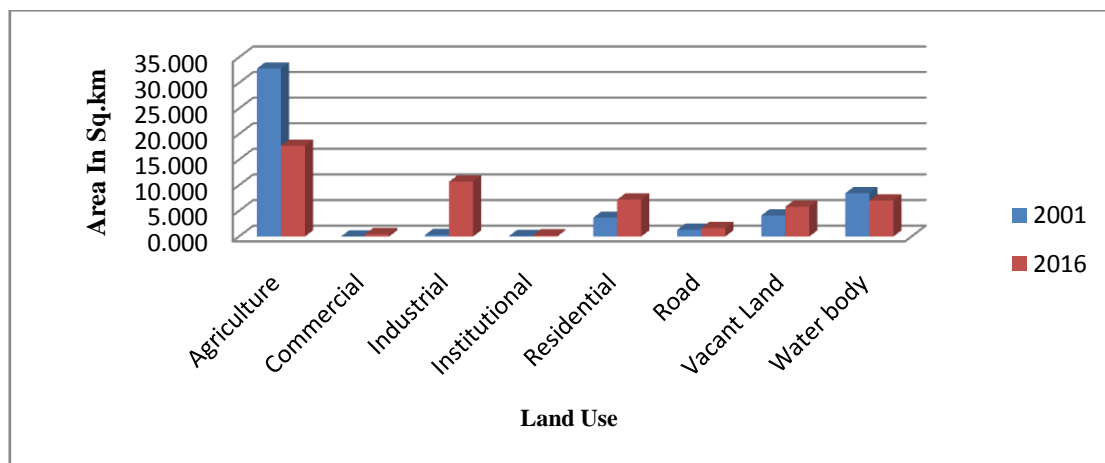
Fig. 1. Land use Change (2001-2016)

From the analysis we shall see a drastic reduction of Agricultural land of about 46% and water bodies of about 17%. The establishment of SEZ has boosted up the Real estate industry to flourish in the study area. There is an increase of 97% in Residential Area and Institutional Area individually. The Agricultural land was left barren due to increase in Industrial Activity. The Drastic increase in Industrial area and low cost of land had increased the Residential Activity in this area, but there is a lack of supporting infrastructure facilities, which had increased dependence on Motor vehicles. The Sriperambadur is a Peri-Urban Area of Chennai which has attracted more growth due to availability of land and lower market rates.

 The lack of connectivity to the newly developed area has been an alarming sign that would put more pressure on the existing road network.

The fig.2 shows a land use of the study Area in 2001, before establishment of SEZ. and the Fig 3. Shows the land use of the study area in 2016 after establishment of SEZ. The water bodies in the study area are being stressed and the encroachment in the water bodies is taking place. There is a huge gap in infrastructure requirement due to unplanned development in the study area. The status of local body has also remained same even after the development industries in these areas, which catalyst for development. There is a requirement of preparation of comprehensive development plan for the study area in order to have a planned growth.
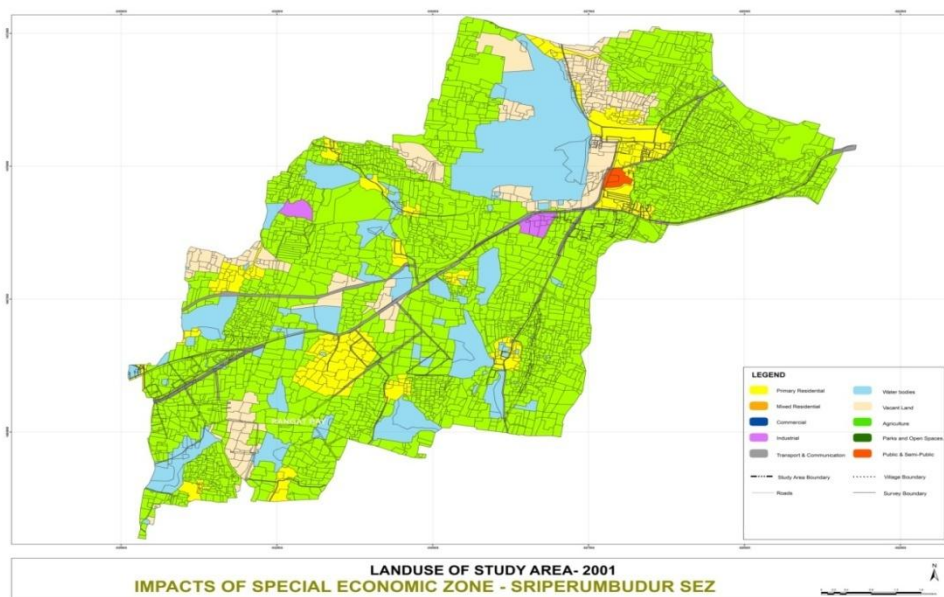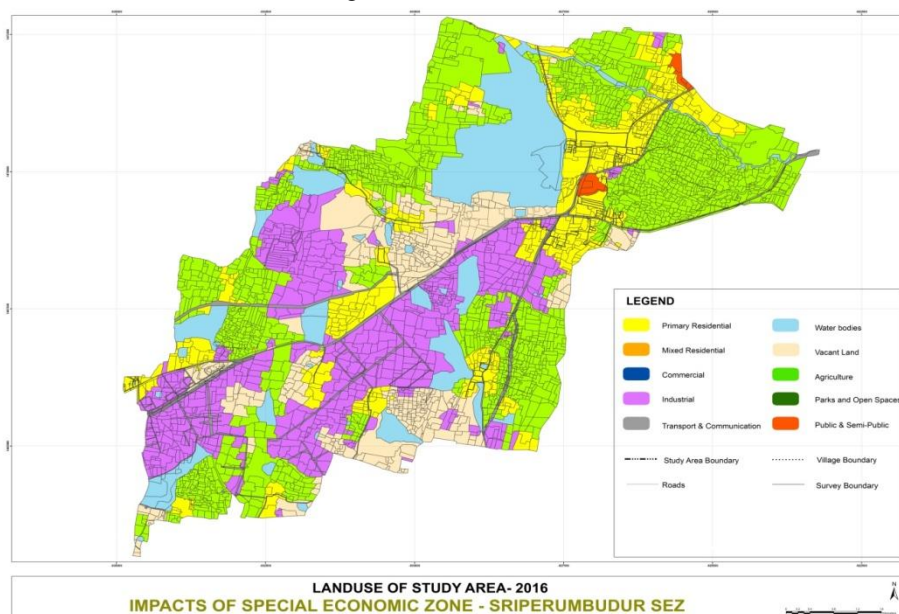

Fig. 2. Land use of- 2001

Fig. 3. Land use of 2016

IV. CONCLUSION

From the analysis it has been identified that there is a rapid change in Land use and about 41% of total study area remains Industrial. Since the area lies in the periphery of Chennai metropolitan area, there is more organic growth, which ultimately pressures on the urban furniture. The Change detection would give an idea of transformation of land use from lower order to higher order. The change detection will also help in prediction of future land use of the study area, which will be more helpful in planning of infrastructure facilities in the towns.

There is also requirement of change policies before establishing industrial areas, an impact Study need to be done and the required infrastructure facilities to be planned in advance, so has to facilitate a planned development in nearby newly Developing industrial areas. Special development Regulation needs to be formed for the Influence Areas due to the planned industries. Proper Environmental mitigation measure needs to be done before beginning operations.

REFERENCES

[1]   Shaban, Social Impact Asssessment of Maha Mumbai Special Economic Zone, Tata institute of social science, Mumbai, 2005.
[2]   Nandini Kulkarni,, A. J. Sanya , Impact Of Special Economic Zones– A Critical Review Of Recent Literature, International Education & Research Journal [IERJ], Volume : 2 , Issue : 8, August 2016.
[3]   Aradhna Aggarwal, Impact Of Special Economic Zones On Employment, Poverty And Human Development, Indian Council For Research On International Economic Relations, May 2007.
[4]   Vidya Bhushan Rawat, Mamidi Bharath Bhushan, Sujatha Surepally, The impact of special economic zones in India: A case study of Polepally SEZ, January 2011.
[5]   Houston, "The impact of interaction in spatial simulation of the dynamics of urban sprawl, landscape and urban planning", Butterworth and co, 2004.
[6]   Aggarwal, "Impact of Special Economic Zone on employment, poverty and human development, Indian council for research on International Economic Relation, Mumbai, 2000.
[7]   Cling, J.P., and G.Letilly, Export processing zones: A threatened instrument for global economy insertion?, DT/2001/17, Development Insertion International, Paris, 2000.
[8]   Madani, D., A Review of the role and impact of Export processing Zones, World Bank Policy Research Paper no. 2238, World Bank, Washington DC,1999.