

PONDICHERRY UNIVERSITY
EXECUTIVE SUMMARY OF FINAL REPORT OF THE WORK DONE ON THE PROJECT

1. TITLE OF THE PROJECT : *Assessment of Urban Sprawl and its impact on the Environment in Puducherry using Geomatics*
2. NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR : Dr. S Jayakumar
 Dept. of Ecology & Env. Sci.
 School of Life Sciences
 Pondicherry University
 Kalapet
 Puducherry – 605 014.
3. NAME AND ADDRESS OF THE INSTITUTION : Pondicherry University
4. UGC APPROVAL LETTER NO. AND DATE : F. 42-417/2013(SR),dt. 23.03.2013
5. DATE OF IMPLEMENTATION : 01st April 2013
6. TENURE OF THE PROJECT : Four Years
7. TOTAL GRANT ALLOCATED : Rs.10,33,800/-
8. TOTAL GRANT RECEIVED : Rs.9,20,800/-
9. FINAL EXPENDITURE : Rs.7,55,843/-
10. TITLE OF THE PROJECT : *Assessment of Urban Sprawl and its impact on the Environment in Puducherry using Geomatics*

11. OBJECTIVES OF THE PROJECT:

It was proposed to assess the land use and land cover change in Puducherry district using satellite data to understand the land cover dynamics and its impact on the agriculture and vegetation using GIS. We also proposed to model the land suitable for urban growth.

12. WHETHER OBJECTIVES WERE ACHIEVED: Achieved

13. ACHIEVEMENTS FROM THE PROJECT:

- a) Land use and land cover mapping of Puducherry district using satellite data was done for three periods.
- b) Detailed groundwater sampling was done for two seasons in 50 locations and the quality of groundwater was thoroughly assessed and published

- c) Land cover dynamics of Puducherry district was brought out.
- d) Environmental quality of Puducherry was assessed.
- e) Urban sprawl and dynamics were estimated.
- f) Land suitable for urban growth and vulnerable were also modeled.
- g) Man power trained - four M.Sc. theses and one Ph.D. thesis
- h) One publication in a journal.

14. SUMMARY OF THE FINDINGS (IN 500 WORDS):

Understanding the land use and land cover dynamics is a prerequisite for proper planning and management of urban natural resources. In developing countries like India, the land use and land cover dynamics are creating lots of pressure on the prevailing environment. Puducherry is a union territory consisting of Puducherry, Karaikal, Mahe and Yanam districts. The built-up area in Puducherry has gradually increased from 968 ha to 11350 ha between 1988 and 2014. The area of vegetation has decreased from 20214.5 ha to 14113.1 ha in 2014 since 1988, while the area covering water bodies has decreased from 4061.9 ha to 1973.85 ha during the same period. It is seen that the monsoon has a general effect on all the water quality parameters. Out of the 23 parameters assessed and quantified in Puducherry, eight parameters were found to be well within the permissible limit of BIS standards. The other 15 parameters were not in the permissible limit in certain areas within the study area. Out of which EC, alkalinity, hardness, TDS, turbidity, cadmium, chromium, manganese, magnesium, lead, fluoride, total coliforms and E.coli showed changes from not permissible to the permissible limit after the monsoons. The Water Quality Index map showed that the overall water quality is fair across communes, including Villianur, Pondicherry, Oulgaret and Nettapakam and some areas that show poor and marginal water quality in Bahour and Mannadipet communes. Based on the questionnaire survey, the environmental quality in Puducherry is good however, the same can be improved further. The Census India report 2011, shows that density of Puducherry district for 2011 is 3,232 people per sq. km whereas in 2001, it was at 2,510 people per sq. km. The urban area of Puducherry has increased from 331.06 ha to 3052.71 ha between 1988 and 2014. About 661.56 ha of area is suitable for urban growth in the coming years which is within just 500 meters from the existing urban boundary. About 1018.59 ha of vegetation and 13.16 ha of water body area, which are within 500 meters from the margin of the existing urban, are under vulnerable condition.

15. CONTRIBUTION TO THE SOCIETY (GIVE DETAILS):

The results of this project will be useful to the town planners of Puducherry to understand the trend in the growth of the built-up area. This report also gives an insight on the conversion of agriculture and other green areas into the settlement, which will be useful to the department of agriculture to take necessary action. The water quality assessment will be useful to both public and government to take necessary measures against the deterioration of water quality. The urban dynamics and the area suitable for urban development will be useful to town planners. The vulnerable model output will be useful to take conservation measures.

16. WHETHER ANY PH.D. ENROLLED/PRODUCED OUT OF THE PROJECT:

A considerable amount of data collected as part of the project is being utilized by Ms. Swapna Sarika Khadanga (enrolled in 2016) as part of her Ph.D. Thesis.

Four M.Sc. theses were produced from this project. Ms. Poulomi Chakravarty, Ms. Shriyanshee (2014), Mr. Thumma Loudu Prakash Reddy (2015) and Ms. Lalramhluni Chawngthu (2016).

17. NO. OF PUBLICATIONS OUT OF THE PROJECT (PLEASE ATTACH):

- Saranya Arwen Carr, Shriyanshee Shrivastava, Thumma Lourdu Prakash Reddy, S. Saran, P. Arunkumar, Suja P. Devipriya and Jayakumar, S. (2015). Analysis and Spatial Mapping of Groundwater quality in Puducherry, India, International Journal of Scientific Transactions in Environment and Technovation, 9 (2): 59-70.
