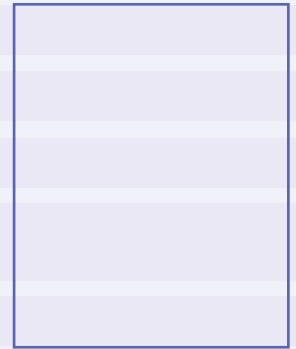


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## Introduction

Urbanization is identified as a critical cause for surface water pollution in Sri Lanka as most of the rivers and streams of Sri Lanka (among 103 major rivers) run through residential areas and due to human activities, many of the streams and rivers are in threat of pollution. Inadequate sanitary facilities, insufficient and improper waste disposal methods are common in urban settings, and people throw unwanted waste into the rivers and streams. Improper waste management is also a major cause of pollution "Meda ela" near Kandy is an example of surface water pollution. Since the canal starts from the Kandy Lake, its catchment is considerably large and covers an area of about 19.31 km<sup>2</sup>. The length of the canal is about 8 km. Many shops, houses and other commercial establishments are located along the canal bank. Though it was a natural canal earlier, it has now become a cement-lined canal, and it is one of the major pollution sources of the Mahaweli river (Silva, 1996). This is mainly due to changes that occurred in the catchment area, viz, increased population growth, changes in agricultural, commercial and residential activities. The general appearance of the stream is environmentally unacceptable. This happens due to addition of wastes such as garbage, sewage, oils etc. The nitrogen loading to the canal is attributed to biogenic wastes such as human and animal excreta, which accounts for a large percentage of the total nitrogen loading (Weerasooriya et al., 1982). According to Silva, (1996) the canal is stone paved only in one part and receives human and animal excreta along almost entire the length from pit latrines.

## Objectives

Major objectives were to find out the changes in land use pattern of Meda ela catchment from 1997 to 2001, analyse the population variation with time and identify the correlation between the population growth and water quality parameters in the catchment.

## Study Area

Study area included the catchment of Kandy lake as well as the catchment of Meda ela tributary. Catchment of Meda ela is comprised of 25 Grama Niladhari divisions.

## Methodology

Secondary data collection and questionnaire survey were the main methodology used for the research. Land use change that includes information on land use for the agricultural, commercial, industrial and residential purposes were collected from the land use planning office, Pallekele. To acquire the data which were relevant to population variations, Department of Census and Statistics, District secretariat, Kandy, Kandy Municipal council and the report JAICA, 2002 were used.

Water quality data were obtained mainly from literature sources. In addition, some publications which are related to water quality of Meda Ela, was used to acquire information. To get information such as types of toilet facilities toilet and methods of garbage removal data from Department of Census and Statistics, (2001) was used. The data, which were taken by a questionnaire survey by the Department of Health Kandy Municipal council in 2008 were used to get the data about garbage removal methods along 'Meda Ela'.

## Results and Discussion

The total population of Meda ela catchment during year 1997 and 2001 are 68931 and 74088 respectively. There has been a 7.48 % increment since 1997. In 1997, Poornawatta West recorded the highest population at 8500 with respect to others and Wattaranthenna recorded the lowest population at 886. But in 2001, the situation has slightly changed with Deyiyanewela recording the highest population and Poornawatta East recording the lowest.

Access to toilet facilities is a good indicator of sanitary condition, as this is strongly related to water pollution . Despite the increase in population, many households have their own toilets. With the population increase, Poornawatta west has many public toilets. Another phenomenon of sharing toilet facilities among households has been observed, and this is evidence of inadequate toilet facilities. However, there are some GN divisions like Lewella, Boowelikada, Malwatta that still do not have public or common toilets. The percentage of people who don't have access to proper toilet facilities is 0.016%. It means there is a possibility of open defecation. It may leads to pollute the water of "Meda Ela". In Heeressagala, many pit toilets are found with compared to other GN divisions. The extent of agricultural lands and domestic gardens have diminished from 1988 to 1996 while built-up lands, forests and water bodies have increased. According to Poddalgoda (1996) water quality of Meda Ela show spatial and temporal variations. As per that report, Sampling points have been taken as ME1, ME2, ME3, ME4, ME5, Up. St (Up stream) and Do.St. (Downstream). BOD5, COD and Suspended Solids were taken as water quality parameters. According to him, downstream watershows higher BOD, COD, T-N and T-P than upstream water except SS (Suspended Solids). From upstream to downstream, it flows about 8 km length. So many pollutants are added to it. This is the reason that the above parameters show higher values from head to tail end of the stream. In addition to that garbage, other wastes may be dissolved in Meda Ela water. It is a reason to increase the BOD, COD, T-N and T-P during wet weather conditions.

## Conclusions

Increment of total population from 1997 has been at a rate of 7.48%. During year 1997, Poonawatta west recorded the highest population and Wattaranthenna recorded the lowest population. But in year 2001 the situation has slightly changed. While Deyiyanewela recorded the highest population, Poornawatta recorded the lowest. This may be due to the migration of people to the city. Land use pattern also changed with the time in different GN divisions. Ogastawatta has higher number of buildings however, the number of building has not increased much from 1997 to 2004. Water quality parameters have changed temporally as well as spatially along the stream. But no any regular pattern of variation of the water quality parameters was observed. Compared with the Sri Lankan standards, only BOD and E.Coli are beyond the maximum permissible level. Though average Nitrates and Phosphate levels are lower than the Sri Lankan standards, range is beyond the maximum permissible level. Poor availability of toilets is an indication of poor sanitation facilities. This study shows that the waste disposal and sanitary facilities are at poor level in different GN divisions.