

## **Chapter 6**

### **Salient Features of the Study Area**

Alappuzha, district was formed on 17<sup>th</sup> August 1957. It has Arabian Sea on the west, a good network of backwaters, lagoons and fresh water rivers land. The district lies between 9° 5' north latitude, 76° 17' and 76° 44' east longitudes. It is bounded on the north by Ernakulam district, east by Kottayam and Pathanamthitta districts south by Kollam district and the west by Arabian Sea. The district at present consists of 6 taluks and 91 revenue villages. There are 12 block panchayaths and 5 Municipalities. In 12 block panchayaths there are 73 grama panchayaths. It is the smallest district in terms of area but has the highest density of population (1492 /Sq.km). The total geographical area is 1414 sq. Km. The population of the district as per the Census 2001 was 2109160. The only district in Kerala having no high lands and forest, it has a coastline of 82 kms. Heavy rainfall, high humidity and a fairly stable temperature throughout the year are the climatic features of the district. The actual average rainfall during 2004 was 2804m.m. The administrative setup, geographical features and comparative demographic particulars of the state and district is given in the appendix.

Alappuzha known as the 'Venice of the East' was the first planned town or municipality in the state of Kerala. The formation of the municipality of Alappuzha was done under the supervision of the then Diwan of Alappuzha Raja Kesava Das. Alleppey town was formed on 1919. The Alappuzha municipality is full of man made canals and bridges designed for promoting trade by water and road. There was also a sea bridge in Alappuzha port for foreign trade. With the development of Cochin port and road transport, the importance of Alappuzha port diminished. The municipality has an area of 46.77 sq kms which is divided into 50 wards. The municipality has a population of 177029 with 37595 households as per 2001 census (Panchayat Level Statistics 2006).

## 6.1 Population growth in Alappuzha municipality

Population growth in Alappuzha municipality from 1901 to 2001 is give in the table: 6.1.

**Table: 6.1 Population growth**

<b>Year</b>	<b>Households</b>	<b>Population</b>	<b>Decadal growth (%)</b>	<b>Population density</b>
1901	NA	24,918	–	533
1911	NA	25665	+3	549
1921	NA	32074	+24.97	686
1931	NA	43838	+36.68	937
1941	NA	56333	+28.50	1204
1951	NA	116,278	+106.41	2486
1961	NA	1,38,834	+19.40	2968
1971	NA	1,60,166	+15.36	3425
1981	28902	1,69,940	+6.1%	3634
1991	33016	174666	+2.78%	3735
2001	37595	177029	+1.35%	3785

Source: Panchayat Level Statistics 2006, Government of Kerala.

NA – not available

From the table it is clear that there was a population explosion in the town during the decade 1941-1951. Afterwards the growth in population has slowed down considerably and in the last decade during 1991-2001 the growth was a mere 1.35%. The density of population has increased rapidly from 1901 to 1951 and thereafter the rate of increase has declined. The ward wise population of the municipality is given in the appendix.

## 6.2 Solid waste generation

The amount of solid waste generated will reflect the consumption patterns, sanitation and the waste management issues of an area. The total amount of solid waste generated in the town is around 60 tones per day. Around 30 tones are collected by the municipality to be disposed. The rest of the waste are simply left uncollected. The wastes are not segregated before disposing and all the waste are mixed and disposed. The waste is dumped in an open dump at a place called Sarvodayapuram in Mararikulam South Panchayat with an area of 14.26 acres and is around 3Km from the town(Information given by the Office of the Health Officer, Alappuzha). The solid waste generation in the municipality is given in the table: 6.2.

**Table: 6.2 Solid waste generation**

<b>Name of the circle</b>	<b>No. of wards</b>	<b>Waste generated in each circle /day</b>
Central Circle	8	12
South I	7	8
South II	10	10
North I	4	3
North II	7	3
Total	36	36

Source: Socio Economic Unit Foundation (2001)

The Central Circle generates the maximum amount of solid waste of 12 tons and the minimum amount of solid waste comes from the North I and II Circles at 3 tons each.

## 6.3 Chemical characteristics of the MSW

The characteristics of the MSW in Alappuzha municipality are given in the table: 6.3

**Table: 6.3 Chemical characteristics**

<b>Density</b>	<b>570kg/m<sup>3</sup></b>	<b>Carbon (%)</b>	<b>17.98</b>
Moisture Content	61.61%	Nitrogen (%)	0.53
Calorific Value	2393 k cal/kg	C/N	34.25
Acid/Alkaline Equilibrium	7	Phosphorous as P <sub>2</sub> O <sub>5</sub> (%)	0.72
Organic Matter	31%	Potassium as K <sub>2</sub> O (%)	0.44

Source: Socio Economic Unit Foundation (2006)

The density of the MSW is 570 kg/m<sup>3</sup>. The organic component of the solid waste is 31% and the pH value is seven which show the neutral nature of the MSW. The chemical composition of the solid waste in the municipality is given in the appendix

#### 6.4 Financial aspects

Developing nations spend between 20 and 40% of municipal revenues on SWM (Thomas-Hope 1998). In India, it is estimated that between 10 to 40 per cent of the total municipal budget is used for SWM (Bhide, 1990). The consolidated statement of the revenue receipts and revenue expenditure of Alappuzha municipality from 2005-06 to 2008-09 is given in the table: 6.4.

**Table:6.4 Financial aspects**

Year	Revenue receipts	Revenue expenditure	Public health expenditure	Sanitation expenditure	Sanitation expenditure /revenue expenditure	Sanitation expenditure/ Public health expenditure
2005-06	77173826	66087800	24531792	22842877	34.56%	93.1%
2006-07	59586792	57723196	22068938	19035085	32.97%	86.25%
2007-08	71522439	65485288	27691000	20839912	31.82%	75.25%
2008-09 (B.E)	98009180	98967200	33838000	30175000	30.48%	89.17%

Source: various budget issues of Alappuzha municipality.

B.E: budget estimate

The public health expenditure which includes sanitation expenditure has shown a consistent increase over the years except in the year 2006-07. Sanitation expenditure includes the expenditure on SWM. Sanitation expenditure as a percentage of revenue expenditure and sanitation expenditure as a percentage of public health expenditure are showing a declining trend over the years. The average spending on sanitation is 32.45% of the revenue expenditure.

## **6.5 Present Solid Waste Management System**

The present solid waste management system in the municipality is briefly explained in the following sections.

### **i) The division of the Municipal area**

The division of the Municipal area for the purpose SWM is given in the Table:6.5

**Table: 6.5 The division of the Municipal area**

Name of the circle	No. of wards
Central Circle	4
South I	14
South II	10
North I	10
North II	12

Source: Information given by the Office of the Health Officer, Alappuzha, 2008

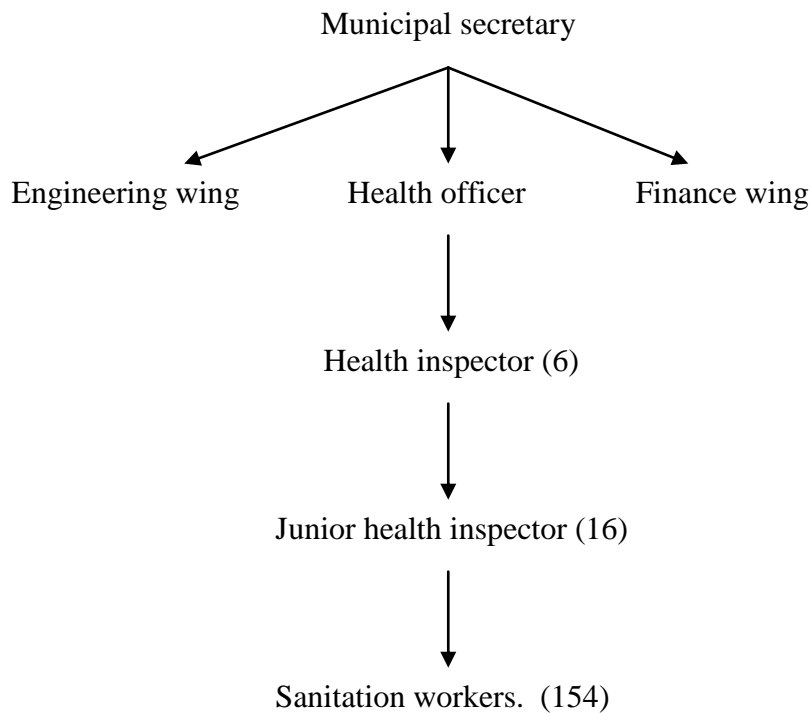
For the purpose of Solid Waste Management, the Municipal area is divided into five main health circles and an anti-mosquito circle. Each circle is under a Health Inspector and two or three Junior Health Inspector. Sanitation work is done by a number of contingent workers consisting of males and females. They are responsible for road sweeping, drain cleaning and removal of

waste to the collection point. Waste is collected from the collection point by the vehicles of the Municipality.

**ii) Administrative setup of MSWM**

The administrative setup of MSWM of the Municipality is shown in figure: 6.1

**Figure: 6.1 The hierarchy of the staff**



Source: Information given by the Office of the Health Officer, Alappuzha, 2008

The Municipal Secretary is at the top of the MSW system. There is an engineering wing and a finance wing to look into the technical aspects and to meet the expenses of the MSW management system. The Health officer is a medical doctor who is assisted by the health inspectors and junior health inspectors. The sanitation workers are responsible for the collection and disposal of the solid waste.

### iii) Vehicles used in the municipal solid waste management

The details of the vehicles used by the Municipality are given in the table: 6.6

**Table: 6.6 Vehicle data.**

<b>Name of the health circle</b>	<b>Tipper lorry</b>	<b>Container lorry</b>	<b>Tractor</b>	<b>3 wheeler (Ape)</b>
Central circle	2	1	-	3
South I	1	-	-	1
South II	1	-	-	2
North I	-	-	1	2
North II	1	-	-	-
Total	5	1	1	8

Source: Information given by the Office of the Health Officer, Alappuzha, 2008

There are 15 Vehicles available for the SWM activity in the Municipality. The five tipper Lorries carry the solid waste to the landfill. Three wheeler (Ape) is used to collect waste from the various collection points in the Municipality along with the container lorry and tractors.

### **6.6 Kudumbasree and MSW**

Kudumbasree is actively engaged in the MSW of Alappuzha municipality. There are fifteen groups of the kudumbasree engaged in the process. Six groups are promoted by the DTPC (District Tourism Promotion Council) and nine are promoted by the Clean Kerala Mission. The kudumbasree units collect waste from households, hospitals, shops and industries and hand it over to the municipal disposal system. The collection charges for the households ranges between Rs.30 and Rs.50 and for the other sectors it depends on the volume of waste collected.

After dealing with the salient features of the study area, a brief account of the impacts of UMSWM is given in the following chapter.

## **References**

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