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Delivery System of Essential Environmental Facilities—A Comparative Study on the Experience of Sapporo and Madras

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Abstract

The responsibility of a City government is the efficient delivery of the Essential Environmental Facilities of desired quantity and quality to the city people. The City governments of both developed and developing countries face similar problems of varying magnitude, dimension and character in the process of delivering the Essential Environmental facilities. While the Cities of developed countries have achieved greater efficiency and management system, the Cities of developing countries are yet to develop desirable level of efficiency. Since the Cities of developed countries have gained a wide range of experience over the years, it is imperative for the Cities of developing countries to take note of such relevant experience to put their plants and management system in proper perspective to achieve greater efficiency. Towards this direction, a small attempt is made in this paperto bring out the salient experience of Sapporo and Madras City governments in the delivery of Essential Environmental facilities.

Key Words: Essential Environmental Facilities, Delivery system, Affordability level, Literacy level, Local governments.

1. Introduction

Delivery of Essential Environmental (EE) facilities to the different cross sections of the society of an Urban area assumes many dimensions in terms of quantity, quality and affordability characteristics of the beneficiaries, besides the physical and fiscal aspects. While the objective of planning and providing for the EE facilities is the same for both developed and developing countries, the problems are not similar in view of the socio-economic fabric, function of the urban areas and the general economic status of the country.

Japan is generally claimed to be the most urbanized country in the world. The country which has very less extent of urbanizable land (compared to many countries in the world) has achieved a great deal of economic development (presently Japan is the economic giant in the world) and urbanization over a period of 4 decades after the World war II. Inspite of having a prominent place in the map of advanced countries, Japan has also been facing severe problems in terms of delivery of EE facilities to the desired quantity and quality. Sapporo city in particular, has been enjoying great importance in terms of being the capital of the

Northern frontier region of Japan. Although Sapporo city has a short history (100 years) of development in Japan, the city has grown in leaps and bounds and faces a variety of socio-economic problems in the delivery of EE facilities to the desired quantity and quality.

On the contrary, Madras City which is a part of a developing country (India), although faces similar problems, the magnitude and dimension of the problems are far more severe. (Please refer the author's earlier publications, references Bo. 1, 2 & 3 for detailed information). The experience gained by an urban area of a developed country in terms of planning, development and management of EE facilities is of paramount importance to the urban areas of developing country in understanding the failures and prospects and to formulate rational policies and programs. Towards this end an attempt is made in this study to compare the EE facility delivery systems of Sapporo and Madras.

2. Population and Urbanization

The major emphasis laid down by the National government of Japan just after the World war II to reduce the population growth by stipulating a policy of 2 children per family proved to be effective in the long run. The population growth has been steadily controlled in tune with the economic development thereby reducing the unemployment rate to as low as 3%. The rapid economic growth has greatly influenced further reduction in the birth rate and the children ratio per family has become as low as 1.7. Due to the simultaneous efforts in enhancing the medical services, the death rate has been considerably reduced. The life expectancy level is the highest in the world; 76 years for men and 83 years for women.

During the early stages of rapid growth, the Sapporo City faced an enormous influx of people in to the City. After 1980 the in and out migration have almost become equal. The low birth rate coupled with less net in-migrants have brought in levelling of in population growth.

Currently the Sappoto government supports more births in terms of financial incentives to the parents, since Sapporo is also experiencing aging of the society.

On the contrary, Madras City, inspite of a family planning program, faces severe problem of population explosion coupled with large scale one way migration into the City. A vast majority of the in-migrants having no demonstrable skill enter in to the labor market and end up with less paid informal sector activities. Lack of well developed and distributed medical service delivery system and the dismal environmental conditions prevailing particularly in slums have been instrumental for high death rate and high infant mortality rate. The population of Madras City is comparatively very young (40% of the total population is below the age of 20).

3. Socio-Economic Characteristics:

Delivery of EE facilities has a direct relationship with the affordability characteristics of the population of the City. In the case of Sapporo income distribution

has been greatly achieved with 80% of the population having uniform income level. Little less than 5% of the population has marginal income, however supported by the National and Local governments directly or indirectly. Sapporo City has never seen growth of slums. The minimum wages have been well established and the so called informal sector activities are less pronounced. The uniform income distribution commensurate with the economic development has been instrumental in helping the Sapporo government to formulate cost effective programs for the delivery of EE facilities.

Sapporo City is a commercial and administrative center. Figure 1. shows the revenue source of Sapporo government. The share of internal revenue amounts to 60% and the rest is realized through National government statutory grants and well defined project grants. Property tax assumes a major share of internal revenue (60%). A large share of commercial tax is also enjoyed by the Sapporo government. Since Sapporo City does not have the benefit of large scale industrial establishments, the property tax is said to be the highest when compared to other similar cities of Japan.

During the initial stages of the Sapporo City development a large scale investment by the National government was made on creation of EE facilities. The demand for EE facilities has been increasing and at the same time, the cost returns has also been substantial. So far the Sapporo government budget was never in the red. Figure 2. shows the expenditure heads of the Sapporo government. Besides special projects, a major share of the revenue is spent on social welfare schemes.

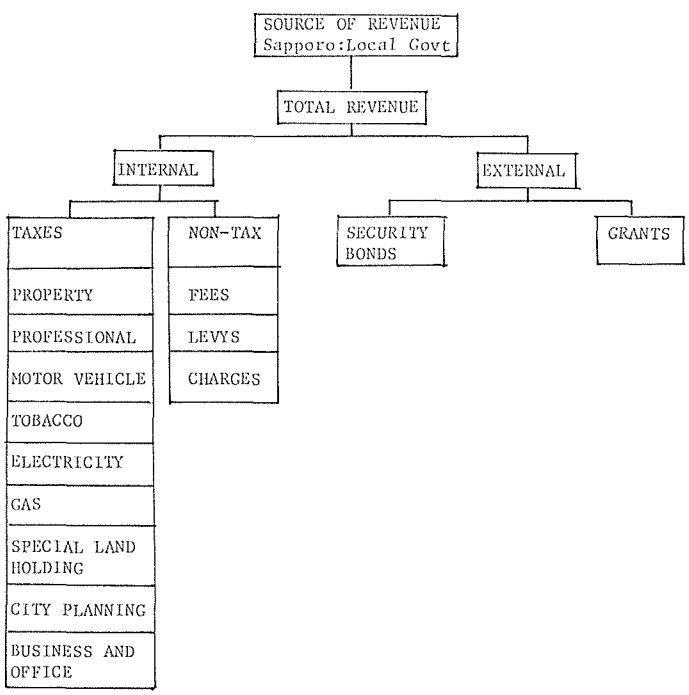

Figure 1. Sapporo Local Government Revenue Pattern.

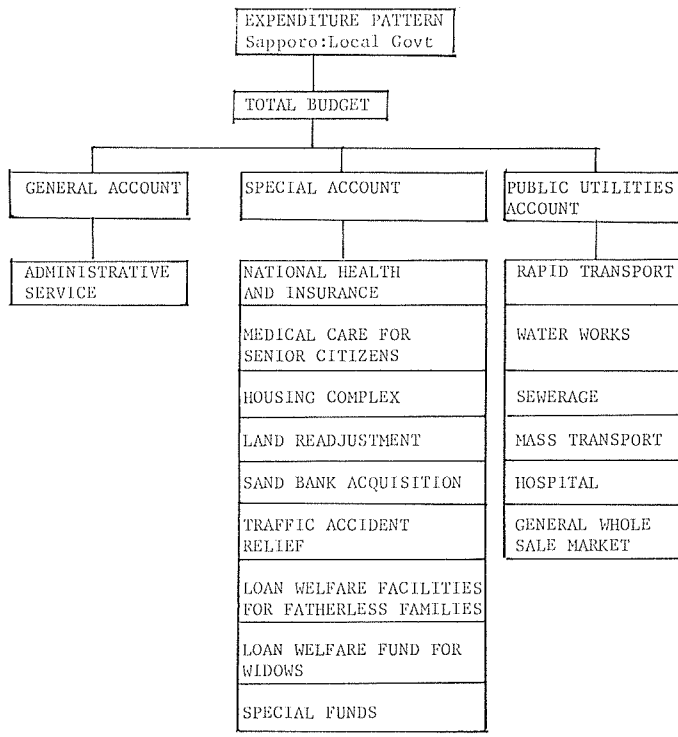

Figure 2. Sapporo Local Government Expenditure Pattern.

All the departments engaged in the delivery of EE facilities are under one administrative control of the City. The elected Mayor of the City is the Head of the local government. All departments under one umbrella have provided the most important benefit of financial planning and co-ordination of various programs.

Unlike Sapporo City, Madras City has a wide gap in the income and affordability levels among the people. There are three distinct income groups; HIG (Higher income group), MIG (Middle income group) and LIG (Lower income group). The wide gap in the affordability level has been responsible for the unequal distribution and inaccessibility to many of the EE facilities.

Figure 3. shows the revenue heads of the Madras City government. The financial share of State and National governments are not well defined; they are piecemeal and constitute for less than 10% of the total requirement. The City government is more often left with the option of augmenting its own resources subject to severe restrictions imposed by the State government. The property tax assumes a major share (85%) of the total revenue. Outdated taxing system and inefficient collection system have diminished the potential of this major source of income. Generation of income through other sources like the commercial tax and special projects are meager. Unlike Sapporo City government, the responsibility of delivering the EE facilities is shared by many independent departments having their own source of income and budget planning. Rational planning and imple-

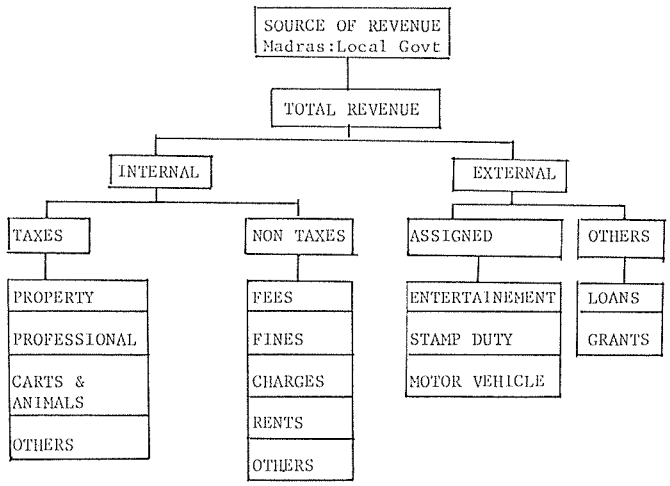

Figure 3. Madras Local Government Revenue Pattern.

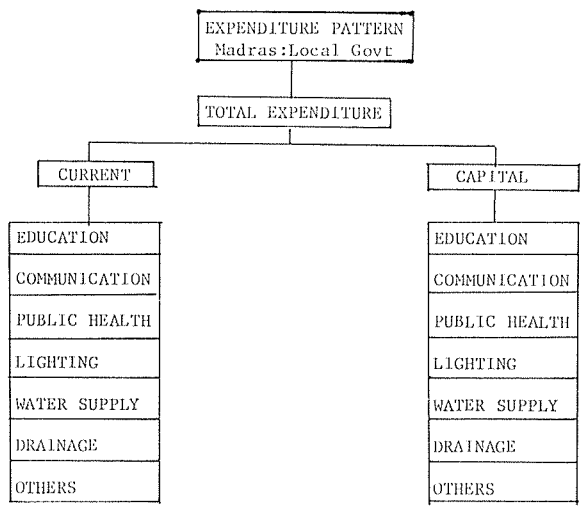

Figure 4. Madras Local Government Expenditure Pattern.

mentation of the programs designed to cater to the various cross section of the population suffers due to lack of inter-departmental coordination and priority oriented budget planning. The Figure. 4 shows the major expenditure heads of the Madras City government. With the current practice of establishing independent departments for the delivery of EE facilities, the functions of the City government have been diluted to that of a maintenance authority with very less financial resources of its own.

The MMDA (Madras Metropolitan Development Authority) constituted as a technical and financial advisory body for the overall development of the City is not fully entrusted with the responsibility of capital budgeting and resource mobilization to fulfill the objective of its creation.

4. Essential Environmental Facility Sectors:

(i) *Education Sector*:

Sustained efforts and continued support delivered to the Education of Japanese citizens over the decades resulted in the 100% literacy rate in Japan. Education is compulsory up to Junior High School and free. In the case of High School and above the education is left to the individual's choice. A variety of technical schools established in tune with the industrial advancement cater to a vast majority of the scholars whose education is above the level of Junior High School. In recent years the number of university scholars are increasing in view of the 'Dual Structure' of the Japanese industries and the fast growing service industries. The higher the education, the better the job opportunities has been the prevailing attitude among the people.

The major problems confronting the education sector facilities are the inadequate land space, maintaining the building stock and creation of new stock to bring down the congestion level in class rooms. A large scale private involvement in delivering the service is highly pronounced in Japan.

In the case of Madras City, the three tier income levels has a pronounced impact on the education system. While the MIG and HIG have a high literacy rate, the LIG suffers from a very low level of education. Lack of economic affordability and awareness of the importance of education prevailing among the LIG have been the general cause for the dismal literacy level. Education up to High School is free. Though the education policy stipulates compulsory education for all up to middle school level, it is hardly realized in practice inspite of many incentive schemes for the LIG.

Government run schools normally cater to the LIG group and the MIG and HIG prefer private schools for their better standard of education although the financial commitment is higher. The major problems confronting the education sector facility are; lack of building and land space, over congestion in all the class rooms. Though the education sector assumes a major share of the budget, it has not been able to achieve increased literacy level. The labor market has a mixture of highly qualified people and people with very low level of education and skills. The labor force of intermediate kind is conspicuously absent.

(ii) *Medical Sector*:

Sapporo City being the capital of Hokkaido island, enjoys a prominent role in the delivery of specialized medical services. Inspite of a well defined medical insurance system, the increasing National and City governments medical care budget has been of great concern. The major reasons contributing to the increased budget allocation are; free medical care to the aged citizens as the share of aged people is steadily increasing, high frequency of visits to hospital by Japanese people (annual average is 13 visits), and long period of hospitalization (average 40 days which is the highest in the world). While the cost of medical service delivery has been increasing the investment on creation of new facilities has been declining in view

of excessive stock.

On the contrary Madras City suffers from lack of well defined and distributed medical service delivery system. There has never been a rational medical insurance system and most often the service cost is free particularly in the case of LIG. Medical service assumes the second major share of the State government budget. The increasing investments do not fetch adequate returns. Besides the common medical care facilities, the programs intended to eradicate many common diseases peculiar to the warm and humid climate consumes a major share of the medical budget. Family planning programs and the after care medical service system also consume a major share of the investments. Highly specialized medical treatment facilities are mostly privately owned and not accessible to the common people due to lack of affordability. The major concern has been planning and distribution of well defined and cost effective medical service system, and finding the appropriate source of finance.

(iii) *Water Supply and Sewerage Sectors*:

Sapporo City is blessed with a perenial source (a dam constructed across a river) of water supply. Almost 95% of the Sapporo City population is adequately covered with City water supply system. However anticipating the likelyhood of water shortage, the City government is planning to restrict the population growth to 1.85 million by 2000. The water supply system is 100% cost effective and the budget has never been in the red. The sewerage system however suffers from lack of afequate coverage (only 76% of the population) in view of physical, fiscal and social constraints. Major problems confronting this sector is the effective collection and disposal at the affordable cost. The combined sewerage system in the City has been a major cause for environmental concern during heavy rainfall as choking and overflowing are common in the low areas of the City. Since Sapporo is a newly planned City with a short history, the water and sewerage facilities are well planned and operated than many of the major Cities of Japan. The sewerage service cost is charged proportionate to the quantity of water consumed and the charges are collected from the public along with water consumption charges. The service cost is determined based on capital investment, operation and maintenance cost and depreciation value.

On the contrary, Madras City does not have a perennial source of water supply (a lake) facing intermittent droughts. The surface source is augmented by under ground source also. Although 83% of the population is covered with the water supply system, an average of 85 lpcd is supplied during droughts. The water supply position in the case of slum areas is grossly inadequate. One stand pipe supplies water to more than 20 families and the per capita consumption is as low as 20 lpcd. A major (40%) portion of the water supply line is very old and leakage and infiltration of underground polluted water is common. The old distribution system coupled with the intermittent supply system have been causing health hazards.

Like Sapporo City the sewerage system also suffers from inadequate collection

and disposal system. Since the Madras City is located on flat terrain, the number of pumping stations and treatment plants involve huge investment. The cost of service for both water and sewerage services are not based on the actual cost incurred towards capital investment, operation and maintenance. Service cost collection has so far been adhoc in nature and never fully realized.

(iv) *Drains*:

Sapporo City has a combined sewer system. Flooding of the low lying areas during heavy rainfall and overflow from sewer manholes is common in Sapporo City. The low lying residential areas which came in to existence due to inadequate supply of developed land, high land cost in the core of the City and lack of awareness among the buyers suffer severe damage due to flooding. Corrective measures undertaken both by National and Local governments are not commensurate with the fast developmental needs.

Similar to Sapporo City, the flood hazards are very serious in Madras City also. The worst sufferers are the slum dwellers. Millions of Ruppees are spent on flood relief operations during heavy rainfall seasons. Having flat terrain with poor arterial and feeder drain net work, the water inundates for several weeks causing severe environmental problems. There has never been an earnest effort by the local government to plan and develop an efficient drainage system. The drainage schemes get the last priority in the local government budget.

(v) *Roads sector*:

Sapporo City has been planned with grid pattern of road network system. Wide roads planned in the core of the City are congested during peak hours because of too many signalized road junctions. Lack of ring road system to disperse intercity traffic has often been the major cause for traffic congestion. The delivery of this particular facility has been shared by three levels of administration; namely (i) the National Highways by the National Government (ii) the Prefectural roads by the Prefectural Government and the (iii) Local roads by the Sapporo local Government. While the City has a well spread local road network, the National highways and the Prefectural highways length is not commensurate with the vehicle population grwoth in terms of vehicles per kilometer. Since Sapporo City experiences heavy snow fall in the winter, the expenditure needed to be made towards snow clearance, spike tyre dust prevention and road maintenance assumed a major share of the budget.

Compared to the less number of vehicles on the road the road network length in the case of Madras City is satisfactory. However on most of the major road sections all the important road side amenities are missing. There are several missing road links to be formed in order to make the circulation smooth. Shortage of funds to carry out the desired road improvement schemes has been a major handicap.

(vi) *Solid Waste Management*:

Sapporo City has a well established solid waste disposal system. More than

45% of the waste is recycled and cost recovered. So far land filling operations have been undertaken as one of the major waste disposal methods. Diminishing low lying areas and high cost of transportation have been demanding the need for introduction of new techniques for solid waste disposal. The incineration plants operated by the government are able to utilize only 50% percent of the heat calorific value of the waste for the purpose of power generation. With the present out dated incineration plants it has not been possible to achieve optimum utilization of the calorific value of the waste and only 80% of the waste collected every day is incinerated. Lack of finance to modernize the existing plants has forced the Local government to construct waste storage silos.

In the case of Madras City a well planned modern solid was management system is yet to be established. A combination of the conventional method of Bullockcart collection and the modern methods of using trucks are being employed. The narrow street network of the old parts of the City and the slum areas are not conducive for employing the modern collection systems. Hardly 5% of the total solid waste is recycled and the cost recovery is insignificant. Utilization of solid waste for land filling operations has been the predominant disposal system. Inadequate solid waste clearance and inefficient land filling operations have been primarily responsible for soil, water and air pollution. The expenditure incurred towards this sector is totally borne by the Local government. The urgent need of the sector is to identify the most appropriate, efficient and cost effective collection and disposal system.

(vii) *Park and Open Space Sector*:

Sapporo City has achieved the highest (10 Sq.mts) per capita open space when compared to all major cities of Japan. Vast mountainous space and river side open space have been developed for active and passive form of recreation. Although the maintenance cost is enormous, the cost returns from the priced open spaces is considerable. Besides the efforts by the Local government, citizens participation in the development and maintenance of the open space is highly pronounced.

Madras City although has been blessed with a forest in the heart of the City faces serious problems in creating and maintaining the open space. Open spaces created through consecutive 'Town Planning' schemes have been gradually eroded by the encroachment and creation of slums. On many occasions even the authorities responsible for creation and maintenance of the open spaces were responsible for destruction of open spaces by putting the land to other forms of development. Lack of concerted efforts from the authorities and the constant encroachment on the open land have been responsible for the dismal per capita area of 3 Sq.mts. Although on per capita basis, the available extent of open space is less, lack of efforts from the Local government and awareness of the importance of open space prevailing among the public have been instrumental in not utilizing the vast sea side and river side open spaces effectively. The open spaces considered to be the lungs of a City is given the last priority by the Local government.

5. Conclusions of the Study:

Sapporo City and Madras City are geographically, economically, culturally and climatically different from each other. What is applicable to Sapporo City can not be applied to the City of Madras directly. The present level of development in the delivery of EE facilities has been achieved in Sapporo over a period of 4 decades. Conserted efforts made by the Local and National governments in simultaneously improving the education and economic activity sectors are the primary reasons for the present day development in Sapporo. Since the EE facilities are the same, to improve the delivery system and to frame meaningful policies and programs it of paramount importance to enhance the affordability characteristics of the people with simultaneous efforts to increase the awareness level of the people through education. It is also imperative in the case of Madras to systematically identify the problem areas and take appropriate corrective measures before the problems grow to unmanageable level. Though both Sapporo and Madras face problems in the delivery of EE facilities of varying magnitude and dimension, the urgent need is to identify appropriate technical tools to assess and frame meaningful policies to achieve the objective within the socio-economic fabric of the Cities.

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