

Financing the Infrastructure of Municipal Corporation on Sustainable Basis: A Case Study of Vasai Virar Municipal Corporation

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ABSTRACT

Every Municipal Corporation must provide administrative services and develop infrastructure for people. The Vasai Virar Municipal Corporation is the fastest growing Municipal Corporation in the Mumbai Metropolitan Region. Urbanization is increasing rapidly in corporations, but infrastructure services are lagging behind. There is a mismatch between the revenue and expenditure of the corporation. The revenue receipts are significantly low due to lower property taxes and road construction. The revenue expenditure is increasing due to administration, architecture section, accounts, hospitals management, and construction sector. The capital receipts are significantly lower because of integrated health and family welfare receipts. The capital expenditure of the corporation has increased due to road repairing and construction, development work, and electricity expenditure. The municipal corporation must invest in civic infrastructure such as water supply, sanitation, solid waste and sewerage management, roads, public transportation, public gardens, street lights, and markets. Municipal Corporations must manage capital expenditure on a sustainable basis for civic infrastructure. It will improve the standard of living of the people.

KEYWORDS: *urbanization, sanitation, sewage*

JEL CLASSIFICATION: *O18*

1. INTRODUCTION

India has been experiencing rapid urbanization for many decades. Municipal Corporations are directly influencing the welfare of the people by providing civil services and facilities in urban areas. The Constitution 73 and 74 amendment acts, 1992 providing additional function, powers and resources and consist of three-tier system of governance to The municipal Corporation in delivering services in the hierarchy (Sharma and Kotkar, 2016). The local self-government was introduced to address to the local issues. A better understanding of the local requirement to fulfill them effectively with the cooperation between local people and local administration is known as local self-government (Sen and Manas, 2021). The local governments or the municipalities are responsible to provide administrative services to the local level and to develop infrastructures to provide physical facilities to municipal people (Sharma, 2017). In the Vasai Virar Municipal Corporation (VVMC), the poor are migrating for employment opportunities. Most of the people from North India and Rural Maharashtra are migrating and live in slums due to lack of development of the housing for poor. Many builders have undertaken large real estate projects. But housing is beyond the reach of poor people. The new areas in the corporation are developing very fast. The provision of basic infrastructure such as water supply, street lighting, and disposal of refuse, communication halls, market stalls, and roads among others is to be performed by the Local Governments

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being the third tier of government and also deals directly with people at the grassroots (Tamil, Selvan and Swaminathan, 2018). Civic services required a good source of funding.

The Vasai Virar Municipal Corporation is continuously expanding its civic services such as water supply, sanitation, street light health care, housing and solid waste management, etc. But quality civic services are inadequate with increasing population and urbanization. The city plans as per wards are developed by corporation. But now, the city needs an upgrade of the entire civic infrastructure.

Most civic services lack quality aspects. People depend on other municipal corporations for quality services such as health care, education, and transportation, etc. The poor people cannot access quality health care in Mumbai city. The Municipal corporation provided health care facilities, but they are an inadequate and less qualitative service. The poor cannot afford private health care facilities. Private health care is beyond the reach of the poor. The Municipal corporation does not receive funds for health care facilities and its development. The water supply is inadequate and irregularly provided in slums. Small children and women carry drinking water, which is required for the family. The roads are inadequate for the increase in vehicles and population. Near the station area, public and private vehicles, working people, and street vendors blocks the roads. There is a continuous increase in traffic in the morning and evening time. The roads are very narrow and are responsible for heavy traffic jams. The expenditure on electric polls, street light is increasing, but still it is inadequate according to the population. Solid waste related expenditure is increasing, but streets are not cleaned every day. People throw waste on the streets and they do not separate dry and wet solid waste in the city. The number of gardens is less in corporation. Water logging is observed in different areas every monsoon in the city. The city administration needs to provide efficient, effective, and responsive urban services to attract investment and contribute to economic development. Therefore, it is essential to strengthen the financial health of the city government (Sen and Manas, 2021). Local governments or the municipalities are responsible for providing administrative services at the local level and developing infrastructures to provide physical facilities to the citizens of the municipalities. Thus, the major functions of the municipalities are the building up the infrastructure and suprastructure and protecting public places, and so on. To conduct such philanthropic works, it is essential to sustain themselves financially (Sharma, 2017). The main objective of study is to find the income receipts and expenditure balance of corporation. The second objective is to find the capital receipts and expenditure of corporation over a period of time. The second and last objective is to find the deficit in the receipts and payment of the corporation. The last objective is to suggest the policies to reduce the gap in deficit and improve finances of Vasai Virar Municipal Corporation (VVMC). The first part of the research paper explains about the data and methodology used to study finances of corporation. The second section explains the growth of revenue and capital receipts and expenditure over the period of the time of corporation. The second and last part of the research paper explains the result of the regression. Lastly, it gives the policy implication and conclusion.

2. DATA

We have downloaded the budgets of the Vasai Virar Municipal Corporation (VVMC). The budgets 2013-14 to 2020-21 are available on the website of corporation. We refer to a number of magazines and research papers related to Vasai Virar Municipal Corporation. Times of India, Maharashtra Times, Loksatta have been referred to understand local issues in corporation. We visited Vasai Virar Municipal Corporation many times to understand the

facilities of the civic infrastructure and the local issues faced by people. We took interviews of few people and businessmen to understand the infrastructure facilities in corporation area.

3. METHODOLOGY

We have used the CAGR to understand the growth in revenue and expenditure of the Vasai-Virar Municipal Corporation (VVMC). The CAGR is defined as follows.

$$CAGR = \left(\frac{W_f}{W_b} \right)^{\frac{1}{t}} - 1 \quad (1)$$

Where CAGR: Compound annual growth rate

W_f = Final value

W_b = Beginning value

T = Time in years

Economic model:

We have developed economic model for revenue receipts, expenditure as well as capital receipts and payment for corporation.

$$\sum_{t=n}^{n=1} RR = DMT + SRT + MPTS + GSTRT + CPT + S \quad (2)$$

RR means Revenue Receipts of corporation and it is divided as Deposit and Municipality Tax (DMT), Special Rule Recovery (SRT), Municipal Property Tax and Services (MPTS), GST, Roads and Tourism(GSTRT), Census and Property Transfer (CPT) and Sankirna (S).

$$\sum_{t=n}^{n=1} RE = GACT + ITO + FLFB + HFW + PGC + ED + TF + S \quad (3)$$

RE means Revenue Expenditure of corporation. It is classified as General Administration and Corporation Tax (GACT), Information Technology and Others(ITO), Fuel Light and Fire Brigade (FLFB), Health and Family Welfare(HFW), Play Ground and Construction(PGC), Education Department(ED), Transfer Funds (TF) and Sankirna (S).

$$\sum_{t=n}^{n=1} CR = GW + RG + SM + HP + POG \quad (4)$$

CR is known as Capital Receipts of corporation. It is divided as Grants for Work (GW), Railway related Grants(RG), Slaughterhouses and Minority(SM), Health and Projects(HP), Projects and Other Grant (POG).

$$\sum_{t=n}^{n=1} CE = CS + AS + CIW + ITS + HFCE + THCF \quad (5)$$

CE defined as Capital Expenditure of corporation. Capital expenditure consists of Construction Section(CS), An Architecture Section(AS),Civic Infrastructure Work(CIW), Information and Technology Section(ITS) , Health and Facility Capital Expenditure(HFCE) and Total Health Care Facilities(THCF).

3.1 About the Municipal Corporation of Vasai Virar:

The Municipal corporations play a significant role in the provision of civic infrastructure to its people. Municipalities and Municipal Corporations, as institutions of local government, are constituents of the third tier that play an important role in local economic development; they have a sizeable proportion of overall public financial resources, but are nevertheless subject to the scrutiny in terms of physical and financial performance (Murugaraj and Tamizhselvan, 2018). Vasai Virar has very close proximity to Mumbai city due to adequate and affordable and consistent transportation. Many people travel by road and railway to Mumbai and Thane city. Vasai Virar is located North by the Vaitarna River, South by the Vasai creek, and West by the Arabian Sea. Vaitarna and Vasai creek are passing through Northern and Southern edges of The Municipal Corporation.



Figure 1. Vasai Virar Municipal Corporation (VVMC)

Source: Sharma (2017)

Vasai Virar Municipal Corporation came into existence on 3rd June 2009. It is the youngest municipal corporation in Mumbai Metropolitan Region (MMR). Due to the high land prices in Mumbai City, easy connectivity via road and railway, people prefer to stay in Vasai Virar. The corporation is surrounded by good beaches, mountains, and rivers.

Due to migration from Mumbai city, North India and Rural Maharashtra, population of Vasai and Virar has increased fast in short period of time. The rise in excess population resulted in proliferation of slums in the city. High population growth put tremendous pressure on civic infrastructure services. The services such as water supply, road network, sanitation, solid waste, sewage, traffic, and transportation have been affected. Vasai Virar has a tremendous scarcity of drinking water. In total 33 MLD water is supplied to four municipal areas from the Usgaon scheme, the Papad khind dam and 0.9 mld from the Pelhar dam. Nearly 30 mld of water is supplied through tankers from various sources. Water is unequally distributed in Nala Sopara, Navghar -Manikpur Vasai, and Virar. The water supply network is observed with MBR. There are water treatment plants in all four areas. But there are large irregularities, inconsistencies in daily water supply distribution. The water pressure in the slums is very low, inadequate, and irregular for each day. People store water in plastic drums, pots, and other utensils. In corporation area, underground sewerage system does not exist everywhere. Households depend on individual septic tanks. The effluent from the septic tanks is discharged into soak pits. The septic tanks and effluent disposal in surface gutters and nallas. It leads to environmental pollution and unhealthy conditions all over city. The sewage system for the corporation is insufficient and it is in bad condition. In Nala Sopara, Navghar Manik pur, Vasai Virar, the sewage lines are inadequate. The Municipal corporation has not invested adequately in the sewerage system and its development over a period of time. The length of

open and closed drains is less and very short. The total area covered under closed drains system is less than 70% of the entire corporation. The sludge is disposed of in Vasai creek. There are no sewage treatment plants in different places. At some places, the sludge is disposed of in the nalla which is connected to the creek.

The Vasai Virar Municipal Corporation is located near the western coast of the region. It receives very heavy rainfall every year from June to September. Every year in the monsoon, the city faces water logging due to more construction and prohibiting of natural drains due to high urbanization. The developed run-off flow of water is inefficient for the drainage system. Nallas are not properly integrated with the natural flow of water. It flows through the green zones of the city. Further, it meets creeks and the Arabian Sea. In the corporation, the main roads provided open gutters for collecting and carrying sludge water from houses. All nullas in corporation are provided gates at a different location. During high tides, the gates are closed to prevent high tide from the Arabian Sea. It prevents sea water from entering through nullas within the city. As the tides pressure gets low, the gates are opened. The water is released into the creek. During high tide, the backwater keeps the nullas full of water. The water in the city does not flow during high tides. Sea water remains stagnant during high tides era. Vasai Virar has high heavy rainfall ranges from 1912 mm (Virar) to 2600 mm (Nalasopara). The high tide level is RL3.25m. The water logging in city leads to mosquito flies and in-hygienic conditions in the city. It causes serious health risks to women and children. Every year water logging is observed in low lying areas and mainly includes Navyug Nagar, Shastri Nagar and Vishal Nagar of Navghar Manikpur. The other three areas in Virar are Mavelphata, Tarwadi, and Virat nagar. The water logging is observed every year in such area. In the above areas, the drainage responsible for storm water entering in the residential area of different parts of the city. The average solid waste generation in city is assumed as 0.45 k.g/Capita/Day. It is more than 600 MT/Day. Solid waste is only collected from building to building. There is no segregation of waste done at any level. Slums are completely ignored in the collection of solid waste. Domestic waste includes mainly kitchen waste, paper, plastic, glass, metal, rubber, etc. The industrial waste and the construction debris are mixed with each other. Solid waste in Virar is dumped in Chiikhhal Dongari (10.6 Ha). In Nalasopara, the solid waste is dumped in the Gogate sult pan (2.4 Ha). In Navghar, solid waste is dumped at 1 km (1 Ha). Solid waste in Vasai is dumped from (4Ha), 1.5 km away from the city. Solid waste from residential areas, street sweeping markets, and commercial establishment is collected and transported through Ghanta gadis. The municipal corporation spends very less on cleanliness of the city and solid waste collection and management.

Revenue receipts and expenditure of the Corporation:

We have calculated the revenue receipts of the corporation over the period of time. It is presented in the following table.

Table 1. Revenue receipts of corporation (2013-14 to 2020-21)

No	Sub-items	Particulars	CAGR
A	The deposit and municipality tax		
	1	Property tax	5.17
	2	Local body tax	-6.81
	3	Cinema and lab tax	-2.38
	4	Advertisement tax	-3.13
	5	Tourism development service tax	-1.76

No	Sub-items	Particulars	CAGR
	6	Special fire brigade tax	2.60
	7	Tax on mobile tower	3.44
	8	Consumer tax	2.78
	9	Solid waste, plastic use tax	0.70
	Total A		4.58
B	Architecture section		
	1	Fees	2.07
	2	Development tax	4.04
	3	Deposit tax	3.63
	4	Development related interest	1.19
	5	Development related NOC	0.66
	6	Fire brigade and security fees	1.35
	7	Occupancy certificate building use	2.43
	8	Building regulate fees	3.57
	9	Building related administrative fees	0.90
	10	An extra floor space index	1.51
	11	Special relaxation premium	2.76
	12	Special development tax	3.31
	13	The spacial TDR sale	0.90
	14	Total deposits	5.39
	Total B		5.39
C	Municipal property tax and services		
	1	JCB and other vehicles rent	1.74
	2	Rent of cultural auditorium and library	-2.12
	3	Building rent	-2.77
	4	Medical institutions receipts	-3.59
	5	Animal slaughter house revenue	0.16
	6	MIDC and transfer fees	0.58
	7	Property transfer fees	0.93
	8	Pay and park vehicles parking management	0.35
	9	Demolition of illegal slums	2.75
	10	Library and entry fees	-2.00
	11	Misplaced books price	-1.62
	12	Market fees/handcraft fees	1.82
	13	Notice fees	4.39
	14	Tobacco sale tax	-2.99
	15	Reading hall waste paper	-0.45
	16	Property transfer fees	0.85
	17	Gym fees	-0.04
	18	Swimming pool fees	0.38
	19	Hearse (dead body carrying) vehicle	-1.88
	20	Ambulance fees	-2.13

No	Sub-items	Particulars	CAGR
	21	Advertisement permission fees	1.19
	Total C		4.62
D	GST and Road, Tourism		
	1	Goods and services tax	6.03
	2	Reading hall grant	0.38
	3	Road inspection grant	-1.00
	4	Revenue stamp grant	3.59
	5	Education tax rebate	1.53
	6	Employment guarantee tax rebate	0.81
	7	Day-NULM	1.89
	8	Integrated health and welfare deposit	1.00
	9	Tourism and culture related grant	-2.45
	10	Grants and rebate	6.22
	Total D		4.22
E	Census and property transfer		
	1	Old scrap sale	0.55
	2	Tender form fees	-3.22
	3	Deepavali issue sale	-0.54
	4	Local member deposit and tax	-1.68
	5	Assessment leaving certificate fee	-0.37
	6	Funeral related wood sale	-0.13
	7	General deposit	-2.51
	8	Accounts related recovery	-0.14
	9	Saving account/investment related interest	2.96
	10	Property transfer fees	0.56
	11	Animal survey related fees	-0.60
	12	Population census and expenditure management	-3.66
	13	Term deposits	3.32
	14	Duplicate fees	-0.34
	Total E		2.76
F	Summary of sankirna		3.69
	1	Construction and N.A.Tax	-2.04
	2	Business professional tax	-0.60
	3	Temporary workers related identity card renewal fees	-0.34
	4	Construction related permission	-1.00
	5	Fire brigade related certificates	1.16
	6	Contractor and suppliers related fines	-2.73
	7	Other certificate fees	0.76
	8	Hospitals and dispensary renewal and registration	1.48
	9	Birth death certificate	-1.93
	10	Marriage registration fees	-1.70
	11	RTI fees	-1.72

No	Sub-items	Particulars	CAGR
	12	Road cutting fees	2.30
	13	Property tax	4.95
	14	Worker welfare fees	0.82
	Total F		5.35
	Total revenue receipts		7.76

Source: Calculated from various budgets.

The property tax of municipal corporation has increased by 5.17 % from 2013-14 to 2020-21. The number of commercial properties and residential buildings is increasing in the corporation. But the corporation still has lower property tax collection. It could be due to lower rates and tax evasion. The higher property tax collections has construction and real-estate/business services sectors which are likely to have a direct impact on the number of taxable properties (Bandyopadhyay, S. 2015). The local body tax has declined to 6.81 %. Now The Municipal corporation has less scope to increase the local tax. The Cinema and lab tax has also declined by 2.38 %. The Municipal corporation does not charge a higher tax on cinema. The advertisement tax has declined by 3.13 % from 2013-14 to 2020-21. Very few applications are observed for advertisements in corporation. On banners and posters, advertisement fees are not charged. The tourism development service tax has declined as 1.76 %. There are few tourist spots observed in this corporation. Tourist only visit to beaches in this corporation. The special fire brigade tax has declined by 2.60 %. Few buildings are there which are required fire brigade and safety. The corporation has maximum slums. Therefore, fire brigade-related tax collection is very low. The tax on mobile tower has increased by 3.44 % by corporation. Every mobile network company, there are mobile towers in corporation. The Municipal corporation charges the tax on mobile towers of every telecommunication company. The deposit and municipality tax has increased by 4.58 %. The architecture section related fees has increased by 2.07 %. The architecture section related development tax has increased by 4.04 %. There are different types of architecture work going on in city. The development related taxes are charged by the corporation. The fire brigade and security fees related revenue receipts has grown by 1.35 % from 2013-14 to 2020-21. It has grown by a very small amount over the period of time. Architecture related special development tax has increased by 3.31 %. The architecture department related total deposit has grown by 5.39 %. The JCB and other vehicle rent has grown by 1.74 %. The rent from cultural auditorium and library has declined by 2.12 %. Due to lack of maintenance, auditorium is not taken on rent. Books are not updated in libraries, therefore visitors to libraries are less. The building rent has declined by 2.77 %. All the buildings in corporation are old and few people live on rent. Rent of such buildings is also less. The medical institutions related receipts have declined by 3.59 %. Demolition of illegal slums related receipts have increased by 2.75 % from 2013-14 to 2020-21. The Municipal corporation keep the regular drive of illegal slum demolition. Those pay fines and regularizes the slums. In such cases, the receipts of corporation increases. The library and entry fees has declined by 2 %. All the libraries are old and not in good conditions. The misplaced book price has declined by 1.62 %. The market fees /handicraft fees has declined by 1.82 %. Corporation has good number of handicraft business and firms. But over the period of time, they have declined fast due to cost of production and competition from power loom industry. The notice fees has declined by 4.39 %. Now most of the notices are coming from the online mode. The tobacco sale tax has declined by 2.99 % from 2013-14 to 2020-21. Corporation has banned the tobacco and tobacco related products. The ambulance fees has declined by 2.13 %. Due to private ambulance services, the Municipal corporation gets very less fees of ambulance. Advertisement permission fees has increased by 1.19 % from 2013-14 to 2020-21. The goods

and services tax has increased 6 % over the period of time. Government has implemented the GST on different goods and services. The collection of GST is increasing over the period of time. The revenue stamp grant has increased by 3.59 %. The education tax rebate has increased by 1.53 %. It is lowest increase observed in revenue receipts. The day NUML has increased by 1.89 %. Central government helps corporation for development of infrastructure under this scheme. The tourism and culture related grant has declined by 2.45 %. Direct grants has declined under this category from state and central government. The grants and rebate has increased by 6.22 %. The tender form fees has declined by 3.22 %. Corporation does not get much revenue from tender form fees. The general deposits has declined by 2.51 %. But saving account/Investment related interest has increased by 2.96 % from 2013-14 to 2020-21. The population census and expenditure management has declined by 3.32 %. The grants related to census has received once in decade. After that, the corporation has to manage expenditure related to census. The contractor and suppliers related fines are have declined by 2.73 % from 2013-14 to 2020-21. The hospitals and dispensary renewals and registration related receipts have increased by 1.48 %. The Municipal corporation charges hospital registration fess. The birth and death certificate related receipts have declined by 1.93 % from 2013-14 to 2020-21. People do not register immediately for birth and death certificate. Secondly, the poor people cannot afford the minimum fees charged by the corporation for birth and death certificate. The marriage registration fees has declined by 1.70 %. The marriage registration fees is higher in corporation. The RTI fees also declined by 1.72 %. The road cutting fees as receipts have increased by 2.30 %. The Municipal corporation has good receipts of such taxes. The property tax related receipts have increased by 4.95 % from 2013-14 to 2020-21. Due to commercial properties and buildings, the property tax collection is more in corporation. The total revenue receipts for corporation has increased by 7.76 % from 2013-14 to 2020-21.

3.2 Revenue expenditure:

The Municipal Corporation has revenue expenditure and it has increased over the period of time. It is explained as follows.

Table 2. Revenue expenditure of corporation

	Total	Particulars	CAGR
A	General administration and Corporation tax		
	1	General administration	3.10
	2	Accounts section	1.55
	3	Architecture section expenditure	2.74
	4	Corporation tax section	1.83
	5	Other tax	2.32
	Total A		2.69
B	Information technology and others		
	1	Computers	2.91
	2	Repayment	0.14
	3	Sankirna	2.44
	Total B		4.30
C	Fuel light and fire brigade		
	1	Fuel and light expenditure	0.93
	2	Fire brigade related	3.20

	Total	Particulars	CAGR
	Total C		4.04
D	Health and family welfare		
	1	Cleanliness	4.38
	2	Vaccination and epidemic diseases	-2.85
	3	Hospitals management	4.42
	4	Natural disaster management	1.92
	5	Archive section	0.71
	6	Birth death registration	0.86
	7	Burning ground	2.53
	8	Animal house	0.65
	Total D		4.15
E	Play ground and construction		
	1	Public ground and playground management	2.55
	2	Pond management	2.77
	3	Transport service	4.54
	4	Construction	4.87
	Total E		6.47
F	Education department		
	1	Primary education expenditure	1.19
	2	Education and public program	3.01
	Total F		3.04
G	Transfer funds		
	1	Transfer funds	5.08
	Total G		5.08
H	Sankirna		3.68
	Revenue expenditure		7.06

Source: Calculated from various budgets

The revenue expenditure as general expenditure has increased by 3.10 % from 2013-14 to 2020-21. As urbanization increasing in corporation, the general expenditure of corporation is also increasing. The architecture section related expenditure has increased by 2.74 % from 2013-14 to 2020-21. Number of plans and sections required more expenditure. The other tax related expenditure has increased by 2.69 %. The computers related revenue expenditure has increased by 2.91 %. Now maximum work of the corporation is done through computers and through online mode. Therefore the expenditure on commuters, printers and laptop has increased. The fire brigade related revenue expenditure has increased by 3.20 %. Few fire related incidences are reported in corporation. Therefore corporation has spent money on fire hydrants, human resource and fire stations in city. The fuel light and fire brigade related revenue expenditure has increased by 4.04 %. The cleanliness related revenue expenditure has increased by 4.38 % from 2013-14 to 2020-21 period. As population is increasing in corporation, there is need to increase the expenditure on hygiene. The vaccination and epidemic diseases related expenditure has declined by 2.85 %. The Municipal corporation does not spent enough money on vaccination and epidemic diseases. The hospital

management related expenditure has increased by 4.42 % from 2013-14 to 2020-21. The Municipal corporation has established few hospitals in few wards. But the quality of such hospitals is very low due to lack of staff and medicines. The burning ground related revenue expenditure has increased has 2.53 %. The public ground and playground related expenditure has increased by 2.55 % from 2013-14 to 2020-21. The number of playgrounds and public grounds are very less in terms of numbers in this corporation. The pond management related receipts has increased by 2.77 %. The transport service related expenditure has increased by 4.54 %. The Municipal corporation spends money on transport facilities. Most of the people use such transport facilities. The construction related expenditure has increased by 4.87 %. The expenditure on primary education has increased only 1.19 % from 2013-14 to 2020-21. The Municipal corporation spends very less on primary education. The revenue expenditure on education and public program has increased by 3.01 % over the period of time. Fund transfer has increased by 5.08 % from 2013-14 to 2020-21. Total revenue expenditure has increased by 7.06 % from 2013-14 to 2020-21. It is significant increase in revenue expenditure in corporation over the period of time.

Capital receipt:

The capital receipts of the corporation are calculated over the period of time. The CAGR is explained in terms of % in the following table.

Table 3. Capital receipts for corporation (from 2013-14 to 2020-21)

No.		Capital receipts	CAGR
A		Grants for work	
	1	Grants for local development work	1.18
	2	Disaster management grant	-0.60
	3	Integrated dam development grant	-0.60
		Total A	0.72
B		Railway related grants	
	1	Railway gate and overbridge amount	-3.72
	2	Fire brigade related grants from MMRDA	-0.70
	3	Sky-walk related grants	-0.80
		Total B	-2.76
C		Slaughterhouses and minority	
	1	Slaughterhouse grants	-0.60
	2	Minority area development fund	-0.50
		Total C	-0.56
D		Health and projects	
	1	Integrated health and family welfare	-0.60
	2	National Urban Livelihood Mission	1.89
	3	Grants from railway	-1.00
		Total D	1.10
E		Projects and other grant	

No.		Capital receipts	CAGR
	1	Project on debris reuse	2.38
	2	Fisheries development grants	1.27
		Total E	1.76
		Total capital receipts	2.59

Source: Calculated from various budgets

The capital receipts have increased by 2.59 % from 2013-14 to 2020-21. The grants for local development work has increased by 1.18 %. The disaster management grant has declined by 0.60 %. The railway gate and overbridge amount related capital receipts has declined by 3.72 %. Sky walk related grants has declined by 0.8 % from 2013-14 to 2020-21. In order to reduce crowd near railway stations and markets, the municipal corporation build few sky walks. The minority area development fund has declined by 0.50 % over the period of time. Integrated health and family welfare related capital receipts has declined by 0.60 %. The capital receipts related to National Urban Livelihood Mission has increased by 1.89 % from 2013-14 to 2020-21. The project on debris reuse related capital receipts has increased by 2.38 %. The fisheries related to development grants has increased to 1.27 % from 2013-14 to 2020-21. The total capital receipts of the corporation has increased by 2.59 % from 2013-14 to 2020-21.

Capital Expenditure:

The capital expenditure of the corporation is calculated from 2013-14 to 2020-21 and it is given as % in the following table.

Table 4. Capital expenditure of VVMC

No	Sub-items	Particulars	CAGR
A	Construction section		
	1	Road construction	2.55
	2	Footpath in corporation	2.35
	3	Other development works	2.07
	4	Reserve funds for development work	5.31
	5	Construction of administrative building	2.96
	6	Construction of Mayer ban glow	0.08
	7	Commissioner bungalow development	0.08
	8	Central library management	2.45
	9	Garden development funds	0.90
	10	Office and committee room repairing	2.02
	11	Internal city over bridges	3.57
	12	Minority area development work	0.90
	13	Night shed related expenditure	1.19
	14	Construction of slaughter house	1.19
	15	Vehicles and road roller expenditure	1.89

No	Sub-items	Particulars	CAGR
	16	Animal house and reservation and construction expenditure	1.19
	17	Transit camp related expenditure	1.88
	18	Dam redevelopment scheme	3.45
	19	Garden sprinkle plan	2.08
	20	Electric fitting and toys for garden	2.23
	21	Books purchase	0.68
	22	Other electric expenditure	3.10
	23	MMRDA through railway overbridge	1.19
	24	Land took over for play ground and stadium	3.96
	Total A		3.89
B	An architecture section		
	1	Renovation of architecture building	1.51
	2	Papadkhid dam beautification	1.63
	3	Foot paths in city	-0.60
	4	Pay and park vehicle project	-0.60
	5	Fish pond establishment	1.72
	6	Animal house establishment	-0.60
	7	Dog house construction	-0.60
	8	Animal and snake house development	-0.60
	9	Upvan beautification	-0.60
	10	City house less people	1.19
	11	New signal management	1.51
	12	Ward level developmental work	3.88
	Total B		2.67
C	Civic infrastructure work		
	1	Road repairing	3.00
	2	Water supply management	1.45
	3	Drama house construction	2.80
	4	Other development work	-1.00
	5	Civil services land acquiring	-0.60
	6	Hospital construction related to work	3.48
	7	Dumping ground management	1.63
	8	Fire brigade management	3.37
	9	Equipment's related to fire brigade	4.24
	10	Garden development	3.09
	11	Reserve category land development	3.18

No	Sub-items	Particulars	CAGR
	12	Multi purpose and small market development construction	2.16
	13	Funeral ground and machine related expenses	2.71
	14	New poll establishment and wire	2.78
	15	Erosion stopping and wall establishment	2.02
	Total C		3.44
D	Information and technology section		
	1	Computer facility establishment	1.58
	2	Computer management system	1.55
	3	Biometric identification	0.97
	4	Total information technology	2.02
	Total D		-1.00
E	Environment and solid waste		
	1	Immiserization of idols	-2.16
	2	Waste related pot purchase	0.38
	3	Infertility dog center	-0.60
	4	Dead body carrying handcart	0.15
	5	Environment protection	1.89
	6	Solid waste management	0.00
	Total E		-1.00
F	Total health care facilities		
	1	Hospital equipment	1.91
	2	Ambulance purchase	1.61
	3	Janitra purchase	-1.00
	4	Dead body preservation and post mortum	1.89
	5	ICU/NICU mgt	1.51
	6	S.T.P Management	1.34
	7	Hospital AC and refrigerator	0.72
	Total F		2.72
	Capital expenditure		7.35

Source: Calculated from various budgets

The capital expenditure related to road construction has increased by 2.55 %. Few roads in corporation are regularly repaired. But all roads are not made up of cement concrete. The footpath in corporation related capital expenditure has increased by 2.35 % from 2013-14 to 2020-21. Foot paths at major roads are maintained by corporation. The reserve funds for development work has increased by 5.31 %. Corporation keeps reserve funds for development purpose. Such funds are increasing every year in corporation budget.

The construction of administrative building related capital expenditure is observed by 2.96 %. Corporation made the provision of money to spend to construct the administrative building. The central library management related capital expenditure is observed by 2.45 %. The Municipal corporation spent money on buying the books, maintain library building etc.

The garden-related development funds have increased only by 0.90 %. It is very low amount of money spent for garden related development in corporation. The office and committee room repairing related capital expenditure has grown by 2.02 %. There are various committees and offices of committees in a corporation. But money is spent less on the repair of the committee room. The internal city over bridges related capital expenditure has grown by 3.57 % over the period of time. The night shed related expenditure has grown by 1.19 % from 2013-14 to 2020-21. The Municipal corporation does the night shelter arrangement to house fewer people in city. But the expenditure on night shelter is much less. Transit camp-related capital expenditure has grown by 1.88 %. It is the lowest growth of expenditure observed on transit camp. The capital expenditure related to the dam redevelopment scheme is observed by 3.45 %. The garden sprinkle plan-related capital expenditure has observed by 2.08 %. Corporation has very few gardens. Therefore, the expenditure related to the sprinkle plan is also low. The electrical fitting and toys for garden-related capital expenditure has grown by 2.23 %. It is very low in terms of the number of gardens in this city. The other electric expenditure in capital expenditure is increased by 3.10 %. There are different types of electric work undertaken by a corporation. The land taken over for playground and stadium related capital expenditure has grown by 3.96 % from 2013-14 to 2020-21.

The renovation of architecture building-related capital expenditure is observed by 1.51%. It is the lowest increase observed in capital expenditure. The Papad khind dam beautification related capital expenditure is observed by 1.63%. The corporation has done beautification work at this location. The capital expenditure related to the fish ponds was 1.72% from 2013-14 to 2020-21. The City house less people related capital expenditure is observed by 1.19%. Few arrangement are done for house less people in different areas in corporation. The new signal management-related capital expenditure was 1.51% over the period of time. The ward level development work related capital expenditure was 2.67%. The Municipal corporation undertook ward development work. The garden's, roads, footpaths are developed. Capital expenditure related to road repairing was 3% over the period of time. Theatre construction related capital expenditure has grown by 2.80%. Corporation has built few theatres in its area. Hospital construction related work expenditure has grown by 3.48% from 2013-14 to 2020-21. Few hospitals are built by the corporation.

The dumping ground management related capital expenditure has grown by 1.63%. The Municipal corporation manages dumping grounds. Solid waste is stored in such dumping grounds. The fire brigade management related capital expenditure has grown by 3.37%. The equipment related to fire brigade expenditure has increased by 4.24% from 2013-14 to 2020-21. The garden development related capital expenditure has grown by 3.09%. Corporation has developed few gardens and spent some money for it. The reserve category land development related capital expenditure is observed by 3.18%. The multi-purpose and small market development construction related capital expenditure has grown by 2.16% from 2013-14 to 2020-21. Market is must for people in surround areas. They buy number of commodities from market. Therefore adequate space for walking,

parking, and space for shops are important. The funeral ground and machine related expenses have grown by 2.71% over the period of time. The new poll establishment and wire related capital expenditure has increased by 2.78%. An erosion stopping and wall establishment related capital expenditure has grown by 2.02%. Every monsoon, heavy rain is observed in corporation. The Municipal corporation has spent money on building walls to stop erosion. Therefore, money spent to construct a big and long wall within different wards.

The computer facility establishment related capital expenditure has grown by 1.58% over the period of time. The maximum work of corporation done through online mode; therefore, the expenditure is increasing on computers. At the same time, the computer management system related capital expenditure has grown by 1.55%. Total information technology-related capital expenditure has grown by 2.02% from 2013-14 to 2020-21. Information technology plays an important role in creating, processing, and acquiring information. The Municipal corporation spends on Ganapati festival and immerisation. But over the period of time, such expenditure has declined by 2.16%. The Municipal corporation spends money on environment protection. Environment conservation and protection play a very important role. Therefore, the Municipal Corporation has spent 1.89% more resources on environment over the period of time. On hospital equipment, the capital expenditure is observed by 1.91%. It is very low expenditure done by the municipal corporation on health. The dead body preservation and post-mortum related capital expenditure is grown by 1.89%. The capital expenditure of corporation has grown by 7.35% over the period of time. The capital expenditure of the corporation is increasing over the period of time. But the resources for capital expenditure have not increased over the period of time.

Regression results:

We have used the ordinary least square regression model (Greene W. 2003). The dependent variable is revenue receipt and expenditure, capital receipt and expenditure.

$$Y_i = \beta_1 + \beta_2 X_i + \dots + \beta_n X_n + \alpha \tag{6}$$

Where Y_i is categorized as revenue and capital receipts and payment from 2013-14 to 2020-21.

X_i is independent variables which are affecting on the dependent variables. The result of the above regression are provided in the following table.

Revenue receipts:

Table 5. Revenue receipts of corporation

Variables	Co-efficient (SE)	T test
Property tax	2.85*(0.11)	25.66
An architecture related development tax,	7.69*(0.30)	25.17
The fire brigade and security fees	27.70*(0.47)	58.53
The road cutting fees	-3.25**(0.67)	-4.83
Constant	-1.60(90.95)	-0.02
Root MSE = 148.56	R-squared = 0.79	Adj R-squared = 0.70
	Prob > F = 0.00	

*Significant at 1 % **Significant at 5 % *** Significant at 10 %

Source: Made by the author

The property tax is positively co-related and statistically significant with revenue receipts. The Municipal corporation charges property tax for commercial properties, flats, industrial area. The property tax collection is increasing due to urbanization and revised property tax rates by corporation. The new constructions are added every year in property tax. The architecture related development tax is positively co-related to revenue receipts of the corporation. Number of tasks completed by the municipal corporation, but they started putting taxes on it. The fire brigade and security fees is positively co-related to revenue receipts of corporation. Every establishment has to keep certain deposits. The road cutting fees is negatively co-related with the revenue receipts of corporation. Households, corporate cut roads for electric work, gas pipeline, sewage line, water lines. The Municipal corporation is charging fees for it. Such roads need to be repaired immediately. But now many corporate and individuals cut the roads for different purposes and they keep it as it is. It makes people inconvenienced in their daily routine work.

Revenue expenditure:

Table 6. Revenue expenditure of corporation

Variables	Co-efficient (SE)	T test
The general administration	4.48*(0.04)	100.96
An architecture section	32.39*(1.12)	28.68
Accounts section	33.37*(1.39)	23.94
Architecture planning expenditure	2.15***(0.51)	4.23
Corporation tax section	-1.31***(0.40)	-3.22
The hospital management	2.88*(0.05)	52.01
The birth death registration	-273.12**(13.20)	-20.69
The market management	101.07**(7.22)	14.00
The construction section	0.325***(0.04)	7.95
Constant	5208.41*(96.94)	53.73
	R-squared = 0.89	Adj R-squared = 0.80
Root MSE = 38.02	Prob > F = 38.02	

*Significant at 1 % **Significant at 5 % *** Significant at 10 %

Source: Made by the author

The revenue expenditure of the corporation is positively co-related to total general administration. Money spent for health, sanitation, water supply, police corporation office etc. Corporation spends on good planning, designs and reports.

The total architecture section related expenditure is positively co-related to revenue expenditure. The account section related revenue expenditure is positively co-related and significant with revenue expenditure. Money is spent on collection of account statistics, laptops, analysis, and payment to staff. The architecture planning related is positively correlated to revenue expenditure. City development plans are prepared regularly. The town planning, maps, designs are drawn, new establishments are planned. The corporation tax section related expenditure is negatively co-related with revenue expenditure. Money spent to collect tax, office staff, vehicles, staff service, visits to corporate, etc. Total hospital management related is positively correlated and statistically significant to revenue expenditure. The hospital expenses, payment to doctors and nurses, medicines, and ambulance is too high for the corporation. The birth and death registration is negatively co-related to revenue expenditure of corporation. Households do not register births immediately. The Municipal corporation, does not charge much for it. But if the charges of certificate of births and deaths increased by corporation then the people do not register the births and deaths immediately. Total market management is positively co-related with revenue expenditure.

The construction-related revenue expenditure is positively co-related and statistically significant with revenue expenditure. The money is spent by corporation on new buildings, sports complex, theatre, etc. New constructions add to the extra expenditure for corporation. If the population increases, then the revenue expenditure of the corporation also increases.

Capital Receipts:

Table 7. Capital receipts of corporation

Variables	Co-efficient (SE)	T test
Grants for local work	1.38*(0.122)	11.30
Fire brigade related grants from MMRDA	0.94*(0.04)	22.22
Integrated health and family welfare	-3.29*** (1.06)	-3.10
Day NULM	2.93**(0.46)	6.25
constant	0.86(45.98)	0.02
Root MSE = 75.10	R-squared = 0.99	Adj R-squared = 0.99
	Prob > F = 0.02	

*Significant at 1 % **Significant at 5 % *** Significant at 10 %

Source: Made by the author

The capital receipts are positively co-related with grants for local work. The grants are received from state and central government as well as local NGO's. Money is used for development purposes. The fire brigade related grants from MMRDA is positively correlated with capital receipts. In order to reduce the fire-related incidences, the MMRDA and state government provides funds to few corporations. It certainly helps to buy vehicles, reduce shortage of manpower, and reduce the loss through modern machines. But the integrated health and family welfare related capital receipts are negatively correlated with capital receipts. Money received from government is spent for different programs related to maternal and child health by a corporation. Most of the programs are targeted at poor localities. The day NULM is positively co-related and statistically significant with capital receipts. The Municipal corporation has received on the national urban livelihood mission from time to time. Under such program, the municipal corporation has spent money on the poor people.

Capital Expenditure:

Table 8. Capital expenditure of corporation

Variables	Co-efficient (SE)	T test
Road construction	1.25*(1.98)	6.34
Development work reserve funds	1.41*(1.38)	10.23
Other electric expenditure	22.15(1.50)	14.77
Constant	6894.74(710.69)	9.70
Root MSE = 421.08	R-squared = 0.99	Adj R-squared = 0.99
	Prob > F = 0.01	

*Significant at 1 % **Significant at 5 % *** Significant at 10 %

Source: Made by the author

The capital expenditure is positively co-related with road construction. The Municipal corporation always spent money on the road buildings, repairing. It is done from ward level to Major roads in city. The development work reserve funds are positively co-related and statistically significant. Most of the time, the reserve funds are spent for development work. It is always done by corporation due to paucity of funds. The other electric expenditure is

positively co-related and statistically significant. Money spent for street light, electricity of new buildings, repairing of old building electricity points etc. Such expenditure is a regular expenditure but it is increasing with urbanization and renovation work.

4. POLICY IMPLICATION AND CONCLUSION

India has been experiencing a very fast growth rate of urbanization. Finance is considered as the lifeblood of commerce and industry. Local self-governments can work smoothly only when the resources at their disposal are adequate and they have to be utilized in an effective and efficient manner (Jariwala, 2016). Every municipal corporation must provide civic services to its population (Rode, 2022). Effective functioning of municipal services requires trained and efficient municipal administration (Kanjilal, 2022). Overall civic infrastructure and planning of The Municipal Corporation always help people to get qualitative services. The local self government is a foundation stone of democracy (Kaur and Verma, 2018).

The Municipal Corporation of Vasai Virar is facing huge traffic, water supply deficit, solid waste, sanitation, gardens and parks, and health care issues. The Municipal Corporation must have good planning for long-term sustainable water supply from the Surya River. The long term water-supply schemes must be planned for rising population. The water supply network must be improved all over corporation. Water pressure is very low in slums. There is need to design house to house water supply distribution network. There is need of drinking water supply meter in every house and commercial establishments in city. The corporation must construct a good drainage system in the city. The old drainage system is not effective to discharge the waste water. City administration need to stop disposal of sewage to natural drainage. The waste water must be treated through water treatment plants. Such treated water must be used for gardening and public toilets. The Vasai Virar Municipal Corporation must clean the water drains regularly. The plastic, garbage and construction waste prohibit the flow of drain water. The Municipal corporation must maintain good hygiene conditions in city. It must appoint more staff for street sweeping, solid waste collection, and transportation. The corporation must buy dumpers, JCB and use technology for solid waste management. Market places, railway station, slums must be paid attention in terms of cleanliness. Maximum dustbins must be provided at such places. The Municipal corporation must prohibit people to throw garbage on the road and streets as well as at beaches. It must put penalties on people who are responsible for such activities. The Municipal corporation must build proper footpaths throughout the city. The paid parking must be built for auto-rickshaws, cars, bikes, and buses. There is a need for property tax reforms by using Geographic Information System (GIS) technology to get much better coverage of properties. GIS technology is used to locate the properties and thereby cover them in the purview of property tax (Jain Archana and Archana Singh, 2022). The municipal corporation is facing issue with capital investment for civic services. The Municipal corporation must increase revenue and capital receipts (Rode S.2021). New methods of taxation must be applied by a corporation. The different services must be brought under taxation in corporation. Tourism must be promoted as the corporation has wide beaches. Taxes must be imposed on tourism-related services. Internal sources of revenue are more stable and consistent than external sources. External sources of revenue are less reliable source of financing because of wide fluctuation in nature (Upadhyay et al., 2016). The Vasai Virar Municipal Corporations must plan to build civic infrastructure on sustainable basis. It must introduce public-private partnership, as well as debt financing for sustainable civic infrastructure services. It will improve the standard of the living of population.

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