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Evaluation of the Role of Thane Municipal Corporation in City's Sustainable Development: Perspective of Industry

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Introduction:

The world is currently exploring the concept of sustainable development-an approach that will permit continuing improvements in the present quality of life and will lower the intensity of resource use, thereby leaving behind for future generations a fair stock of natural resources. It is a fundamental challenge for the humanity to ensure simultaneously an improved standard of living and better quality of environment. This demands to combine the elements of development and environment. This challenge can be met only through a paradigm shift in the process of planning and implementing of various development projects. Fast pace of urbanization has made this challenge all the more tough. For overcoming this challenge successfully we definitely need a local approach, with the participation from various stakeholders in the area. Such an approach to development cans surely further environmental sustainability in all areas.

To tackle the problem of environmental deterioration and to achieve effective environmental management in India, the 74th Constitutional Amendment Act (CAA) 1992 was passed. The Twelfth Schedule of this Act has listed a number of functions in the context of urban local bodies such as regulation of land use, water supply, solid waste management, and urban forestry, provision of urban amenities and protection of environment and promotion of ecological aspects. It has ushered in a new era of urban governance and environmental management in India.

The task of Environment protection is enormous; hence it is necessary to build an effective collaborative management system that includes local government, corporate, residents and voluntary organizations. Sustainable urban development envisages improving the quality of life in cities through improved local governance by reinventing a city as an inclusive city. Such a city provides space and voice to all its stakeholders through inclusive decision-making.

The city of Thane is growing at a very fast pace and is a major hub for industry and also services. The centrality, easy accessibility, existing infrastructure, established market place, civic services, facilities and recent trend of tremendous developmental activities make this city more pivotal in Mumbai Metropolitan Region. Thane Municipal Corporation has initiated reforms prior to implementation of Jawaharlal Nehru National Urban Renewal Mission (JNNRUM). The efforts of TMC have been recognised by Central and State governments as well as by various renowned agencies. Hence we chose this city for our study.

Our study reviews the measures undertaken by an urban local body namely Thane Municipal Corporation (TMC) for the Sustainable Development and better governance of city of Thane, Maharashtra, India, and also understand the impact of these measures from the perspective of industrial units in Thane who are one of the important stakeholders in sustainable development of the city.

In section 2 below we sketch the profile of Thane city, in section 3, we specify the objectives and hypotheses of our study methodology used by us and describe our sample. We describe in section 4 the measures undertaken by TMC for sustainable development, in section 5 we analyze the responses of industrial units, and discussion and findings are in the last section 6.

Profile of Thane City:

The city of Thane is one of Maharashtra's major industrial town and the district headquarters. The National Decennial Census 2011 pegged the population of the city at 18,18,872. Thane is included in the Mumbai Metropolitan Region (MMR). The geographical jurisdiction of the Thane city spreads over an area of 128.23 sq. km. The planning authority for the city of Thane is the Thane Municipal Corporation being established in 1982. TMC is charged with planning, regulation, control and co-ordination of urban growth

within territorial jurisdiction of the city. It also has responsibilities to provide basic civic amenities to the citizens along with the preparation and execution of infrastructural development projects. The territorial area has been divided into nine wards viz. Kopari, Naupada, Uthalsar, Kalwa, Mumbra, Vartaknagar, Chitalsar Manpada, Wagle Estate, and Railadevi. The Thane city's infrastructure and growth of it as planned city has turned the face of Thane city remarkably from last few decades.

The major industrial estates like Wagle, Kalwa, Kolshet and Balkum complex were developed in Thane during 1960-70, which has changed the status of the town as major industrial town in Maharashtra. The growth in population, demand for retail developments and educational developments has opened the gateway for other services like the finance, banking, insurance, personal service sector etc. The city is slowly moving towards being a high end knowledge service provider with the multinational companies outsourcing their non-core processes.Its unique location and the geographical characterization have also affected the growth and placement of urban structures within the city.

The productivity of urban areas largely depends upon the efficiency of the urban infrastructure. Thus, for the sustained economic growth of the city, efficient delivery of urban infrastructure services along with the expansion of services commensurating with the pace of urban population growth is of crucial importance. The TMC has been awarded for instituting numerous good governance initiatives, which are as given below-

- Clean city award from HUDCO 1999-2000
- Zonal award under Sant Gadgebaba Gram Swachta Abhiyan from state government 2003-04
- First Municipal Corporation to implement Solar operated water heating system mandatory to all new buildings. Subsequently Government of India Ministry of non conventional energy has asked other Municipal Corporations to follow Thane model.
- Award for energy conservation from the Maharashtra energy development agency for two consecutive years 2003 and 2004
- Award for excellence in Municipal Initiatives from CRISIL for the year 2004-05
- Sector award at state level for Solid waste management
- National award for energy conservation ,pollution control laboratory has been recognised by government of India
- 'HUDCO' Award to Thane Municipal Corporation for Various Environment Conservation Project in the Year 2012
- At Convention of Biodiversity world Conference held in October 2012 at Hyderabad Thane Municipal Corporation has signed MOU for Conservation of Biodiversity

RESEARCH METHODOLOGY:

Objectives

- To review efforts of TMC for sustainable development (SD) of a city.
- To understand responses of industry with regard to their satisfaction with TMC's SD (infrastructure provision) measures
- To comprehend agency preference by industry for infrastructure provision in Thane city, and their Willingness To Pay, if any for betterment of environment (or SD)
- To review the contribution of industry in environment management of a city

Hypotheses

- TMC has taken active measures to ensure environmental sustainability for a city.
- Satisfaction level of industry is high with regard to infrastructure provision by TMC
- Partnerships among various agencies or stakeholders rather than the single-handed approach of TMC is preferred by industry for infrastructure provision in city
- Industry is willing to pay for betterment (conservation) of environment
- Industry actively contributes in pollution control and environment management of a city (or SD through their Waste control practices)

Data Collection and Analysis

Secondary data mainly from TMC's website was obtained to identify role of TMC in ensuring environment sustainability (or SD) for a city.

Thirty (30) industrial units into manufacturing and services were covered for our study. Primary survey based on questionnaire and interview was carried out for this purpose. Industrial units' satisfaction and their willingness to pay for furthering the provision of physical, social and environmental infrastructure activities by TMC and their preference regarding the agency or partnerships among agencies to provide infrastructure were analyzed.

Responses were also obtained regarding industrial units' waste management practices and their participation in environment related activities.

Sample Description

As far as industrial units were concerned, representative units of all types were sought to be covered. This included both industries from Wagle estate industrial area and from other parts of thane like Khopat, Panchpakhadi, Pokhran road 1 and 2, Balkum, kolshet, Dhokali, Kalher, Godbunder road, Majiwada, Kalwa, Mumbra, and Diva. Manufacturing and maintenance units as well as Common Effluent Treatment Plant (CETP) members and non- CETP units were covered. A total of 30 industrial units were covered in our sample.
Responses were obtained from industrial representatives like proprietors/owners, partners, chief executives, directors or from managers through a structured questionnaire.
Units into manufacturing and services in to areas of Construction, Fabrication, Automobile, Financial services, Computer services, chemicals, Pesticides, shirting, Finished fabric, FMCG, Infrastructure, Engineering, Casting, Electric goods, Packaging, manufacturing, Call centre, Safety products , Alarm system, Cold chain and industry related services were covered.
The units were located in the region for at least three years and the unit with longest tenure was eighty eight years.
The 30 units covered a vast range in terms of turnover/production from a minimum of Rs 80,000 per annum to Rs 3,000 crores per annum.

Measures for Sustainable Development Undertaken By TMC

A multi-stakeholder approach and participative method has been adopted by Thane Municipal Corporation, to promote sustainable development of the region as envisaged under the JNNURM. TMC works in proactive mode for addressing sustainable development issues in TMC area.
The TMC has adopted a number of institutional provisions for this purpose as narrated below:

City Development Plan (CDP)

With the growing population in the city and also on account of the changing economic scenario, a long term CDP became necessary. Under JNNURM, the TMC has drawn a CDP. A situation analysis and identification of gaps in physical, environmental and social infrastructure has been carried out in the CDP. VISION 2031, also a CDP, is to make Thane a global metropolis and a world class city, where the people of Thane can experience growth in their standard of living and improved qualities of life in a sustainable environment. It favors a more holistic, inclusive, integrative and creative approach.

Environmental Status Reports (ESRs)

The TMC prepares an environmental status report (ESR) each year since 1996 as per Maharashtra Pollution Control Board's guidelines .The goal of assessing the status of environment is planning for sustainable development by ensuring that quality of life of the people is maintained and, if possible, improved while maintaining the quality of environment.

Dissemination of Public Information and Grievance Redressal

Public disclosure and participation forms an integral part of community management. To eliminate these problems TMC conducts Municipal Lokshahi Din on 1st and 3rd Monday of every month, A complaint desk is created wherein the complaints from the citizens are received through e- mail and the same are addressed by the Commissioner through major leading state level news papers. Citizen Facilitation Centre (CFC) is launched by TMC to achieve highest levels of transparency, accountability and citizen servicing standards.

Thane Municipal Corporation has also installed 6 LED boards for displaying different environment related messages and different projects of TMC for citizens, on experimental basis.

Monitoring Centers for Environment Management

Monitoring is a fundamental aspect of environmental management at both policy and at program levels. The TMC has established a number of monitoring centers for the various aspects of environment protection. The air monitoring is carried out by Maharashtra Pollution Control Board at three places. Kopri Ward Committee Office, Shahu Market Naupada, and Glaxo Co.Vartak Nagar. As per National Ambient Air Monitoring, the air quality of Thane city is observed to be better in comparison with nearby cities like Mumbai, Pune and Nashik. In areas of sustainability and to reduce pollution Thane Municipal Corporation has setup a 120 MLD sewage treatment plant at Kopari. 17% area under TMC is connected to sewage plant. Because of the Sewage Treatment Plant at Kopari, the quality of water being discharged in Creek has improved; different birds are seen here now. The same water can be used for other purposes like watering trees, Flushing, washing, etc.

Participatory Approach of TMC

In keeping with global thinking, TMC has also adopted a participatory approach for environmental management. The TMC plays a multi-faceted role in this context. In addition to this, the TMC also performs the roles of educator, advisor, promoter and innovator. The uniqueness of these projects stems from multifaceted partnerships forged across various levels i.e. Central Government, Parastatal Agency, Local Educational Institutions, private agencies and CBO's which were formed to achieve a common goal ie. Restoring ecological balance.

Some initiatives in this line are:

4.5.1 Lake conservation- The objectives focused were restoration, conservation, protection and preservation in order to control contamination and to restore ecological balance of the lakes. The CRISIL Advisory Board partnering with the Ministry of Urban Development has recognized TMC's effort by awarding in the ULB-Multiple stakeholders partnership category for initiative towards Eco-friendly idol immersion.

4.5.2 Green cover- Rapid urbanization causes destruction of mangroves and tree cutting, thereby creating ecological imbalance. Hence, TMC initiated the plantation drive and more than 19,000 mangroves have been planted along the creek & 2000 neem trees planted at selected locations. The programme also includes the development of Nature Park and botanical gardens.

Solar energy- Energy Ministry, Central Government has selected Thane City for developing as Solar City, under 11th Five year Plan with objective of energy conservation and cost saving. Accordingly, TMC under law has made it mandatory to all new buildings and all existing public buildings to install solar water heating system and is giving a rebate of 10% on property tax to existing residential buildings on installation of solar water heating system.

4.5.3 Solid waste management- Bio-Methanisation plant with technical support from BARC, disposing Bio-medical waste by setting up treatment plant with the support from the NGO M/s. Enviro Vigil, Plastic recycling and composting project with the help of NGO's – M/s. Apoorva Mahila Sanghatna & M/s. Stree Mukti Sanghatna are some of the interventions made in the field of solid waste management which goes a long way in addressing the environmental issues.

Water supply- Thane Municipal Corporations' water treatment plant is at Temghar. Water supply in 2011-12 was 460 lakh MLD, whereas water quality in distribution system was 95% which is as per WHO standard. TMC has taken active steps to augment water supply in the city. This is done through automation of water supply which is expected to reduce water distribution losses caused by manual operation. The automation is based on data received from Supervisory Control And Data Acquisition (SCADA) system. ESR 2012 mentions that to achieve 24 X 7 water supply within Thane Municipal area automatic water meters, water auditing, avoid water leakages, use of automatic SCADA facility, improvement in water distribution are being implemented. A 110 MLD water supply project was also completed and commissioned in August 2009. The project was funded by the state and central governments to the extent of 40 percent under the central government Jawaharlal Nehru National Urban Renewal Mission (JNNURM)

TMC as Educator, Promoter and Innovator

Apart from the traditional regulatory functions, TMC also plays special role in innovating and creating awareness about environmental resource conservation.

As an educator on world environment day, CD on Lake Conservation for Public Awareness was published by TMC. Thane Municipal Corporation has also developed an Urban Research Centre at Majiwada, where up to date library, exhibition hall, conference hall and modern presentation technology facilities are available.

Building of Dr. Kashinath Ghanekar Play Theater and Kala Bhavan in 2011-12 and creek shore beautification by TMC are examples of its role as a promoter .Total 30 km long creek shore will be beautified, which will have facilities like green corridor, gardens, Congress center, Nature Trail, information Center, Bird Watch, Cultural center, Water transportation, nursery, Tourist center, commercial center, city plaza and civic center.

Thane city has four different eco-systems such as Sanjay Gandhi National Park, Creek, Lake and Garden. These eco-systems are rich in biodiversity. Thane Municipal Corporation is making continuous efforts for conservation of these eco-systems. TMC has innovated new idea regarding disposal of E waste. The work of disposal of E-waste from TMC office was assigned to Eco Recycling Ltd. In the year 2011-12, corporation has disposed 3000 kg. of E-waste.

Corporation Administration has decided to give 5% discount in property tax to the societies which will reduce the solid waste up to50% by recycling/reusing. In rapidly developing Corporation area, daily 700 MT solid waste is generated. The disposal of this waste is becoming difficult day by day. That's why Corporation has declared 3 – R scheme for residential societies i.e. Reduce, Reuse and Recycle.

E – Governance

Another institutional provision is the use of modern technology and networking in surveillance and governance. The facility status includes TMC Website. On this website updated information of all departments of TMC, information about new projects, Blood Banks on the city, Ambulances, Hotels, lakes, Entertainment places, gardens, schools, colleges is available.

TMC through its performance in various regards is trying to ensure environment sustainability. Sustainability requires multi-dimensional focusing and hence the projects have been categorized as physical, environmental and social infrastructure. While planning for the development strategy, financial strategy has also been planned. TMC plans to invest total 4840.66 cr (2006-13) in various infrastructural projects. Apart from their own resources TMC's reliance is mainly on Public Private Partnership, grants from Government of Maharashtra, and from JNNRUM, and on external resources and beneficiary contribution.

ANALYSIS OF INDUSTRY RESPONSES

We collected and analyzed the responses of industrial units as regards their waste disposal methods, their participation in environment related activities, their satisfaction about infrastructure provision by TMC, their rating of TMC's efforts, their willingness to pay for infrastructure expansion and the agency they prefer for this purpose.

Waste Disposal Methods of Industrial Units

The units were asked about the methods of waste management they follow and this is represented in the table 1 below. Waste management practices of industrial units are important for environment management in the region.

Table 1 Waste Disposal Methods Of Industrial Units

Waste Disposal Methods Used by Industrial Units	Number of Industrial Units Using Method	Percentage of Units
Treated in factory premises	04	13.33
Sent to effluent treatment plant	05	16.67
Recycled	07	23.33
Let into creek/ water bodies	00	00
Dumped into municipal bins/grounds	11	36.67
Any other method	08	26.67

Industrial units are using more than on method of disposal of waste. Majority of the units(11), around 37 percent dumped their waste in municipal bins or grounds. Seven units (23.33 percent) finished fabrication units mainly and others into electric goods and FMCG segment recycled waste. Five industrial units (16.67 percent) into automobile, engineering and finished fabrication category reported that they sent their wastes to effluent treatment plant. Four units,(13.33 percent) manufacturing steel plant, chemical and finished fabrication units treated waste in the factory premises. Around 27 percent units used other methods such as reuse their waste, scrape it. Stainless steel casting company mentioned that their waste is used for land filling outside city. Some companies have claimed that they don't generate waste.

Participation in Environment Related Activities by Industrial Units

We studied the nature of participation of industrial units in environment related activities as shown in Table 2.

Table 2 Participation In Environment Related Activities By Industrial Units

Nature of Participation	Number of Industrial Units	Percentage of Units
Contribution of money to environment activities	10	33.33
Planting of trees	13	43.33
Separating solid, liquid and gaseous waste	05	16.67
Educating workers about waste management	04	13.33
Educating people about social/Environmental causes	05	16.67
Air quality monitoring	07	23.33
Effluent treatment	06	20.00
Any other	05	16.67

Table 2 indicates that 43.33 percent of the units plant trees in their factory and office premises. 33.33 percent also contribute money to environment activities or to NGOs supporting environmental or social causes. 23.33 percent participated in air quality monitoring. Units from finished fabrication, engineering, chemical and FMCG segment (20 percent) treat their hazardous waste at effluent treatment plant or send their waste to the CETP. About 16.67 percent of the units into finished fabrication, chemical, and FMCG segment, separate different forms of waste such as solid, liquid and gaseous. Five units (16.67 percent) covered are also engaged in Educating people about social/Environmental causes. Four units (13.33.percent) stressed that they train their workers regarding handling and treatment of waste and also aim to minimize waste. Five units (16.67 percent) covered mentioned that they are engaging themselves directly into social causes.

Satisfaction Level of Industrial Units

We measured satisfaction level of Industrial units on a 5-point scale as regards physical, social and environmental infrastructure provision by TMC. This is represented in table 3 below.

Table 3 Satisfaction Of Industry Regarding Infrastrucutre Provision By Tmc

Category	Excellent	Very good	Good	Average	Poor
Physical	16(8.89)	21(11.67)	62(34.44)	64 (35.56)	17 (9.44)
Social	07(7.78)	01(1.11)	34(37.78)	38(42.22)	10(11.11)
Environmental	13(8.67)	08(5.33)	47(31.33)	46(30.67)	36(24)

(Note: Figures in parenthesis indicate the percentages to the total)

Among the surveyed units we found that with regard to physical infrastructure (PE) 35.56 percent i.e. maximum of respondents rated it as "average" followed by 34.44 percent as "good" whereas around 12 percent rated it as "very good" around 9 percent considered PE as “excellent” is seen in Table 3. No unit rated physical infrastructure as “poor”.

In case of social infrastructure (SE) again maximum number of them rated it as "average" (42.22 percent) followed by "good" (37.78 percent) and only 8 percent rated it as "excellent" and 1 percent as "very good". Not a single unit rated PE as “poor”.

With regard to environmental infrastructure (EF) however satisfaction level is much lower as 24 percent units rated it as "poor", 30.67 as "average" and 31.33 percent as "good". Very low percentage of units, around 8 and 13 respectively rated EF as "very good" and "excellent".

Overall Rating of TMC's Measures by Industrial Units

The industrial units were also asked to rate on a five point scale the current efforts of TMC to make Thane a better place to live in with 1 representing "poor", 2 "average", 3 "good" ,4 "very good" and 5 "excellent" as seen from Table 4.

Table 4 Overall Rating By Industrial Units

Rating	Number of Units
1	00
2	07
3	16
4	07
5	00
Total Units	30

Majority of the units in the sample have rated the work of TMC as "good " (16 units), followed by "average" (07 units) and "very good" (07 units) as shown in table 4 above. None of the units in the sample assigned a rating of five i.e. "excellent" or one i.e. "poor" or to TMC. These findings are quite consistent with earlier findings in section 5.3.

Willingness To Pay (WTP) of Industrial Units

We asked industrial units if funds are to be raised for expansion of Infrastructure in Thane city, how much they are willing to pay per month (WTP). Their total WTP reflects the social benefits received by industrial units from TMC measures.

The total WTP of the thirty units in the sample worked out to be RS. 10,67,700 and the average WTP was RS. 35,590 per month. Eleven units (37 percent) responded 'zero' WTP. The minimum WTP amount was Rs.0 and the maximum amount was RS. 10,00,000 per month.

Preferred Agency for Infrastructure Expansion in Thane City

We studied the preference of industrial units' regarding the agency or partnerships among agencies that should take up the expansion of activities in areas of solid waste management (SWM) , maintenance of green spaces and water bodies, provision of transport, health and education and building of roads, flyovers and bridges. The responses are seen in Table 5

Table 5 Preferred Agency For Infrastructure Expansion In Thane City

Agency□ Activity/area□	1	2	3	4	5	6
SWM	21(70)	05(16.67)	02(6.67)	01(3.33)	01(3.33)	00(00)
Green Spaces	11(36.66)	01(3.33)	05(16.67)	02(6.67)	09(30)	02(6.67)
Lakes/ponds	12(40)	04(13.33)	04(13.33)	03(10)	05(16.67)	02(6.67)
Roads, flyovers, Bridges	15(50)	05(16.67)	00(00)	08(26.67)	01(3.33)	01(3.33)
Transport facility	12(40)	08(26.67)	03(10)	06(20)	01(3.33)	00(00)
Health facility	08(26.67)	02(6.67)	06(20)	04(13.33)	07(23.33)	03(10)
Education facility	12(40)	01(3.33)	05(16.67)	06(20)	04(13.33)	02(6.67)
Total	91 (43.33)	26 (12.38)	25 (11.91)	30 (14.29)	28 (13.33)	10 (4.76)

(Note: Figures in parenthesis indicate the percentages to the total.)

Note: 1= TMC, 2= Industry, 3= VOs/NGOs, 4= TMC and Industry, 5= TMC and VOs, 6= Industry and VOs.

Table 5 indicates that maximum units preferred TMC for all seven activities listed above (43.33 percent) ,which was followed by preference for other agencies. In case of SWM after TMC, industry was preferred (by 16.67 percent units). For maintenance of green spaces (by 30 percent), water bodies (by 16.67

percent) and health facility (by 23.33 percent) after TMC next preference was for Partnership of TMC and NGOs. For roads, flyovers and bridges (by 26.67 percent), and also for education facility (by 20 percent) partnership of TMC with industry was preferred after preference to TMC. Preference given to various partnerships together was by 32.38 percent of units.

Discussion and Findings

We noted in section 2 that TMC has received many prestigious awards for good governance, our first hypothesis is accepted.

Our analysis of satisfaction level reported by industrial units shows that for maximum number of units it is moderate, thus our second hypothesis is refuted. Satisfaction level for environmental infrastructure provision measures by TMC was perceived as much lower by units compared to physical and social infrastructure.

TMC's good performance has led the units to prefer TMC the most for infrastructure expansion, thus refuting our third hypothesis.

The total WTP of around Rs.10,00,000 per month shows that industry wishes to contribute for betterment of infrastructure, and thus our fourth hypothesis is true. It indicates that there is huge potential for levying environmental tax by the public authorities.

Also our fifth hypothesis is valid is borne out from our analysis in sections 5.1 and 5.2 indicating high level of participation by units in environmental activities.

Industrial units surveyed suggested improvement in road conditions, transport facility i.e. more frequent TMT buses to Wagle estate industrial area, more parking space, public toilets, traffic control, cleanliness, improvement in green spaces and beautification of lakes, and improvement in overall governance on part of TMC.

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