ISSN 0024-5623

Local Government Quarterly

April - June 2016

A Journal of the
All India Institute of Local Self-Government

Brought out by its
International Academy of Urban Dynamics

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All India Institute of Local Self-Government (AIILSG), established in 1926 has been actively working in the field of urban development management and is a diligent partner in promoting the cause of local governance in India and overseas.

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The Academy offers strategic contribution to urban vision, policy and planning across countries and cities through multi-level research, documentation, debate, advocacy and capacity-building. It aids the crafting of innovative solutions to urban challenges through sharing, networking, dissemination and advisory services.

The Organization has embraced certain values including a pervading quest for excellence, perpetual learning, and the sharing and interpretation of knowledge that is grounded in ethics and truth. IAUD would undertake non-partisan analysis and evaluation of situations, facts and figures and render advice that is non-adversarial in intent and positive in content with a view towards better alternatives.

Vol : LXXXVI, No. 2 April - June, 2016

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Local Government Quarterly
Published by the
All India Institute of Local Self-Government

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Local Government Quarterly

Printed by Capt. Anant Modi, The Director General, All India Institute of Local Self-Government, at Copytronics, Bandra (E), Mumbai - 400 051 and published by him at the All India Institute of Local Self-Government, 11, Horniman Circle, Mumbai - 400 023.

Editorial

Decent livelihood for all; the only worthwhile objective

Amidst the din and noise in the country over various issues, every Indian realizes that the most pressing issue in our country today is jobs and livelihood or Rozgaar for its citizens. This imperative is receiving sharper focus in view of the demographic dynamic of our population, considered by many as a very favourable indicator and something that will propel our economic growth rapidly. The truth is that with about 50 percent of the country's population below the age of 25 and nearly 65 percent below 35 there is an urgent need to effectively harness the energies of this vast population. This 'young' profile of the population has existed for some time and will continue for many years more.

Work or jobs are required in large numbers to meet the growing aspirations of the youth. Work is necessary for various reasons. Here work has a connotation larger than jobs. While jobs are what give one monetary rewards, work may be voluntary, unpaid, and creative. Work, including jobs, provides various benefits-economic rewards and security, enhancing self-esteem, poverty alleviation and expression of creative energy. It is of particular value to the disadvantaged including women and persons with disabilities. Work is therapeutic for the distressed and especially voluntary work such as that by care givers enhances the well-being of care receivers, namely children, elderly and the disabled. Work of musicians and artists enriches the quality of human life. Work as a fundamental dynamic of human life in fact finds place as the eighth of the Sustainable Development Goals (SDGs) as follows; “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”.

The focus here is however on jobs; work that provides economic rewards. It is estimated that of the world's 7.3 billion people, about 3.2 billion are in jobs. The rest do voluntary, creative work or are preparing for jobs (students). Jobs have very considerable impacts on global incomes, poverty and human development. Jobs have, in the past enabled better wealth distribution across countries in both, the

developed and developing countries. A lot still needs to be done though. By some accounts, the richest one percent of the global population holds nearly 48% of all the global wealth. And eighty percent of the population has only 6% of the wealth. More jobs are required urgently to redistribute global wealth more equitably. In 2015, 204 million people including 74 million young were out of jobs. Over 800 million were nearly jobless-earning less than $2 per day, the poverty threshold, and over 1.5 billion persons were employed in vulnerable jobs-unsafe, exploitative or hazardous jobs- child labour, forced labour, and so on.

Agriculture, Industry (mainly manufacturing) and Services are the sectors which provide employment opportunities including opportunities for self-employment. Globally, the share of agriculture in the economy has been declining. It fell from 6.4% in 1995 to 3.0% in 2010. The share of agriculture in employment too has fallen while still remaining very high, from 41.8% to 33.1%. In India the share of agriculture in the GDP (15%) and in employment (61%) remains higher than world averages but continues to decline. Services occupy the highest percentages both in terms of GDP share and employment.

Agricultural jobs are characterized by seasonality and low pay. The sector also employs the bulk of the low-knowledge, unskilled workforce, a large number working on their own farms or in farm related occupations. Given the high dependence of the sector on the weather and rain-fed irrigation, the prospects for incomes are vague and uncertain at best. At worst, they can lead to extreme farm distress often resulting in farmer suicides as seen in some regions of the country. No wonder that prospects for meaningful jobs in the agri sector are declining and resulting in a deluge of populations into cities. Of late the government in India has been making attempts to stimulate the farm sector to delay if not block the movement of population into cities, at least until it improves the readiness of cities to cope.

Industry comprising mainly manufacturing is being looked at as the vehicle to provide wholesome employment to the growing population of young job seekers. In India, government has launched many national initiatives such as 'Make in India' to attract manufacturing investments from across the globe. The Prime Minister himself has traveled widely to seek investments. A few decades ago, China built its economy and transformed its vast lands into factories for the world. Manufacturing however is now being overwhelmed by a huge technological onslaught which hinges on automation of processes on the shop floor. Robots are increasingly taking

over large numbers of repetitive, precision operations. Nearly 1.5 million such robots are estimated to have been deployed in 2015 worldwide. Digital transformation has ensured that none but the well-qualified, technically trained shop floor personnel are required. Many of these moves are driven by cost-cutting imperatives in an ever competitive market place resulting in a race to the bottom as far as lowering production costs is concerned. In other words manufacturing has turned into a highly skill intensive playground where only the most technically competent can find jobs.

That leaves services. World over and in India the sector has the largest share in in GDP and employment. As economies mature, the share of services tends to grow. More importantly, with digitization and the increasing use of information technology in manufacturing, the line between manufacturing and services has tended to blur. Activities and outputs which were earlier counted as part of manufacturing would now be classified as services due to the use of IT. But things are not hunky dory in services too. Many services jobs may soon be rendered obsolete, sacrificed at the altar of digital technologies. Banking is one such sector. We have seen that with the advent of internet banking and the proliferation of ATMs one needs to visit bank branches less often, sometimes never for months on end. Naturally then, banks need less employees. Accountants filing our income tax returns may no more be required in most cases with the availability of online apps. Driver less cars as and when they become a day-to-day reality, will get rid of many well-paying, moderate skill jobs. Teaching is another area. With the advent of net enabled distance learning, we need fewer classroom teachers. And with the increasing trend of multiple choice questions and online computer based testing, and less of paragraph type answers, you no more need an army of checkers/evaluators. Computers print out the student's score at the end of the examination itself. That's so many more jobs lost in services.

Governments all over the world chase economic growth (GDP Growth) as the solution to all ills. It is believed that faster economic growth will generate more jobs and provide livelihoods to large parts of their population. There is the well-known trickle-down theory- if you generate enough wealth, some of it is bound to flow down to the poorest. Alas! The link between economic growth and jobs may no more be automatic; it is nebulous at best. Mr. Sidharth Birla, former President of India's FICCI says in the Hindu Business line quoting a CARE report “despite the economy growing at a good pace, employment seems to have grown meagerly, at 4.1 per cent and 0.3 percent in FY14 and FY15….More importantly, core physical

sectors such as manufacturing, mining, construction and non-financial services had negative employment growth ranging from minus 3.8 per cent to minus 17.4 per cent in Fy15."

National and provincial governments also focus on education and skilling as a necessary tool to meet the needs of employers while providing livelihoods for workers. A recent statement by an Indian Minister citing Census 2011 says that of the Country's 362.6 million main workers, 104.4 million (28.8%) are illiterate. The majority 130 million (35.8%), while literate, have education below matriculation. 71.4 million (19.7%) are literate with matriculation but not graduates. All this adds up to 84.3% of the main workforce. Some revealing information this is. A related statement by Mr. Birla quoting studies states "close to 90 per cent of youngsters completing engineering or management studies are actually unemployable".That's sad commentary on our educational system and its ability to provide jobs.

The stakes are too high. If the world fails to productively engage and employ the large population seeking jobs, we will have a large pool of young people who are losing whatever skills they have, who have no opportunity to acquire new on-job skills for the future, who will suffer loss of self-esteem, and in the worst case, who no more believe in the rule of law.

So what then needs to be done? If agriculture can no more sustain a large workforce, if manufacturing is turning too sophisticated and technology driven with less need for feet on the ground, if services will be subject to increasing levels of digitization and lower demand for human work; if economic growth is no guarantee for new jobs; if education, often irrelevant, can have only limited impact on making people employable. One possibility is for policy makers to focus on job creation rather than just on economic growth believing erroneously that growth will naturally deliver more jobs. An oft quoted example is of the garment industry. A large Indian garment manufacturer with annual revenues of about Rs 18 billion employs 32,000 people, mainly illiterates with short training inputs, while an automobile company with annual revenues of nearly Rs 500 billion employs about 13,000 people. This is not to say that we do not need to make cars and trucks but garments instead. Rather to say that we need to identify sectors and activities which can absorb large numbers of our workforce including many less educated and vulnerable sections in quick time. Double quick time, shall we say?

Issues of Exclusion and Inclusion in Decentralised Local Governance Institutions in India: Focus on Odisha

Padmalaya Mahapatra

Introduction

India is a country of villages. Panchayati Raj system has influenced the village life extensively as one of the most important units of democratic decentralization. Almost all states have enacted their Panchayat laws in order to conform with the spirit and content of the 73rd Constitutional amendment. Accordingly elections have been conducted. Reservations have been provided to the excluded and marginalized groups. With these developments an impression has been created that the whole representative democracy has been transformed into a participatory democracy and the hitherto excluded have been included in governance and administration through the device of reservation of seats in local bodies.

However, there are still several problems when we examine the issues of substantive inclusion of the marginalized in the functioning of these elected bodies and how they are able to achieve for their constituents in terms of promoting Good Governance. By merely creating institutions or providing formal training to people who hitherto lived and continue to live at the periphery of society and economy does not guarantee their entry into local governance. The forces of patriarchy and caste are the two socially powerful forces that deter women and Dalit participation respectively. Bringing such marginalized groups into the political sphere requires addressing the issues of dominance and exclusion both at the level of institutional structures and processes as well as at the larger social setting which the marginalized groups inhabit.

Secondly, Panchayats are engaged with service delivery diverting all their attention to the provisioning of developmental goods and services such as water, electricity, housing, education, sometimes at the cost of promoting social justice.

Thirdly, the rapid economic growth agenda of the state, particularly under neoliberalism and globalization has unravelled a new set of questions on role and mandate of Panchayats relating to the governance of commons on which people's survival is dependent. Even the tribal regions which fall under Panchayat Extension to Scheduled Areas Act (PESA) both the government and the industry have collaborated to negotiate directly with people without engaging Panchayats. PESA Act 1996 extends Panchayats to the tribal areas of eight States of India namely, Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Maharashtra, Madhya Pradesh, Odisha and Rajasthan with the intention to enable tribal society to assume control over their own destiny to preserve and conserve their traditional rights over natural resources.

Thus 'Inclusion of the marginalized groups in local governance' has been a serious problem in our civil society. 'Inclusion' in this context means the inclusion of the marginalized sections-women, Dalit and tribals in local governance. However, 'inclusion' cannot be understood, without having any reference to 'exclusion'. Exclusion needs to be countered to promote inclusion. Since exclusion and inclusion are inter-related, new insights on inclusion through sincere analysis is required on both: causes, consequences and means of exclusion as also the ways in which marginalized groups work towards their inclusion. Women, Dalit and tribals have suffered social and economic marginalization for a long time and therefore are considered for affirmative action. While the focus on exclusion – inclusion has largely centered on how they take place within local governance institutions, an important area which needs further solution relates to exclusion of Panchayat institutions in situations of political conflict or economic contestation. More study needs to address this field to generate insights on what happens to inclusion when local governance institutions themselves get excluded from the processes of development and governance.

From the above discussions it is clear that there are two aspects that have significant implication for inclusion of the marginalized: (a) violent conflicts and political unrest, and (b) neo-liberal economic growth, globalization and commoditization of commons such as land, water and forests.

(a) Violent conflicts and political unrest:

We have a stable democracy in India. Despite this, political conflicts have aggravated in specific regional contexts. Two types of conflicts have been raised in recent times- the armed conflict

in the North Eastern region which has taken the shape of separatist movements and conflicts between the State and the Maoist groups (popularly known as Naxalities) in Chhattisgarh, Jharkhand, Odisha, Andhra Pradesh and West Bengal where the Maoist groups claiming to be messiahs of the poor have launched violent assault against the government.

(b) Neo-liberal economic growth, globalization and commoditization of commons such as land, water and forests:

In the present scenario of neo-liberalism and globalization we are witnessing economic conflicts between those whose resources are threatened by rapid economic growth and those who are actively pursuing these, have intensified immensely. In pursing economic growth, Panchayats as local decision-making institutions are either bypassed or co-opted by the economically powerful forces in executing their agenda. In many parts of India people are protesting against the establishment of special economic zones on lands whose resources are to be sacrificed on which their survival depends. For example, people of Singur and Nandigram in West Bengal and Kalinga Nagar in Odisha are protesting against the establishment of the Special Economic Zones. Similarly in tribal areas of Odisha, mining operations by multinationals have faced opposition from local people. In other parts of India, it is not entirely unknown for financial incentives being offered in the short run inducing a peaceful co-option of the Panchayats in the neo-liberal agenda of the state but in the long run carrying with it the possibility of the communities losing control over their natural resources.

How inclusion takes place in the context of social and economic inequalities in which Dalit, tribal and women live? Within the micro sphere there are three critical problems:

(i) Manipulation of structures and process underlying the functioning of local governments:

The Constitution Amendment Acts and the confirmatory acts passed by the State Governments have created opportunities for inclusion of the marginalized through affirmative action. There is aclear and unequivocal conceptualization of the local governments as inclusive of those who have been in the periphery of society and have largely been isolated from the decision-making

process. In practice however, when Panchayats interact with the local socioeconomic structures, the possibility exists for the power structures to get mirrored within the governance institutions. The marginalized groups who occupy weak positions in social and economic hierarchy can find themselves weakeven within the local governments. While there presentation of the weaker sections is officially sought through affirmative action, in the actual practices that take place within the institutions, they are subjected to multiple types of discrimination and exclusion. We find women getting excluded in a predominantly malespace; and low castes and poor getting excluded when the locally dominant caste and economically powerful groups occupy the positions of power in Panchayat institutions.

(ii) Mobilization for inclusion:

Efforts are underway in recent times to address the 'power and politics' played in the spheres of local governance. Such mobilizations in recent times are visible in several ways. These include (i) Forming collectives by discriminated groups such as federations of women elected representatives (ii) Alignment with political parties (iii) Occupying alternate (and sometimes competing) spaces available for local development such as water users group, village education committees and self-help groups / micro finance groups.

(iii) Violence against the marginalized to prevent their inclusion:

Violence against the marginalized by locally powerful groups to prevent their inclusion is the extreme form of exclusion. Such types of violence often happen to women and Dalits. In this regard, patriarchy and caste are the two most dominant socio-cultural forces that determine positions of women and Dalits in social hierarchy. Violence in the sphere of local governance can manifest as physical, verbal (e.g abusive language), and even symbolic (e.g spreading rumours). Women have often faced such violence both within their homes and outside for entering local governance. Dalits have faced violence from high castes. Violence creates fear among the victims and the groups they belong to so that they do not dare challenge the power structures within local governance.

In reality many State Governments have reluctantly fulfilled the formalities to satisfy the Constitutional requirements.

Beyond that, they have not looked at the spirit of the Constitutional Amendments. Hence, the inclusion of marginalized groups could not take a concrete shape as envisaged in the Constitutional Amendments. Still it is in a budding stage. It will take time to institutionalize the marginalized groups in the fold of decentralized democratic process.

Some scholars have observed that changes have taken place in the caste structure. Villages where all castes were living as separate groups in the past are now coming closer and, with the lessening of negative aspects of casteism, a process of cooperation has started. Andre Beteille, in his studies, observes that political power in villages and outside villages is not connected with the ownership of land and up to certain extent, it is also independent of any caste and group. Possibly the important factor in this context is the numerical support. Panchayati Raj has also lessened the importance of caste Panchayats. There is a decrease in the exploitation of villagers by the landlords, money-lenders and upper castes; participation of Scheduled castes, Scheduled tribes, and Backward Classes has increased in rural development. With the introduction of new Panchayati Raj system, there is an increase of women's participation in leadership.

As the most marginalized groups are uneducated anduntrained, the power equation is still in the hands of higher castes. Nevertheless, a process of political socialization has begun within the society.

Political decentralization does not mean participation only in the electoral process. Therefore it calls for active involvement of marginalized groups in the functioning of rural local self-government institutions and pursuit of collective decision-making process, and their own transparent governance.

Participation cannot be imposed on the marginalized from above; it should be voluntary and based on will to participate. Here, by participation we mean direct involvement of people and not indirect involvement through their representatives. An equitable sharing of the benefits of development by marginalized groups is possible only when there is equitable participation by them in the process of development. By doing so, marginalized groups can influence the decisions at the higher levels through their joint efforts and common voice. This may be termed as “bottom up approach to integrated rural development.”

Marginalized groups' participation or involvement can better be understood as: (a) participation in decision-making; (b) participation in implementation of development programmes and projects; (c) participation in monitoring and evaluation of development programmes and projects (d) and participation in sharing the benefits of development.

More specifically, most of SC/ST and women representatives were facing the problem of non-cooperation from the official and upper castes/ dominant sections of their Grama Pannchayats. These problems have not only been obstructing developmental works but also not enabling elected representatives of participate in the Panchayats. These problems are not confined to Odisha only but exist everywhere in different degree of intensity.

However, experiences gained so far also show that the affirmative action for women and marginalized groups in local governments has resulted in social identities and political awareness among them and created an urge to become a part of mainstream political, economic, and social life. After initial clashes between higher castes and lower castes, there are no indications of social cohesion at local levels. The political space given to marginalized sections has to some extent dealt a blow to the asymmetrical social structure and given greater space for their participation and involvement in decision-making at the local level.

Many social scientists observed that due to 1/3rdreservation of seats and subsequently 50% reservation for women in rural local self government in many states, many women were elected to local bodies. They have been given the opportunity to share power with men. But in spite of their representation it has been found that the elected women representatives are treated as 'puppet' in the Panchayat Raj Institutions. Most of them remain silent spectators to the proceedings of the Panchayat meetings and rarely participate in the discussions. They hardly voice their own opinion regarding development administration. Simply sitting and listening to proceedings of the meeting has been their form of participation. Due to male dominance, elected women members are functioning more or less as dummies- the husbands of women Sarpanchas are actively participating in the Panchayat matters instead of allowing their wives to take part in the decision-making process. Financial matters are not tackled by the women representatives and for

this they depend upon their husbands or sons or any other male relatives. Practically it has been found that two heads are functioning at Gram Panchayat levels- She head (de-jure) – the elected women Sarpanch and He head (de-facto)-the real Sarpanch. Attendance of elected women representatives in Gram Panchayat meetings is found to be very low in Odisha.

Another important stumbling block on the way of women empowerment is family influence. Many families do not allow their elected women representatives to work together with government officials and others. The influence of casteism is also found to be another constraint in the process of women participation. It was noticed that upper caste people are either hesitant or unwilling to honour or implement decisions taken by scheduled caste leaders. These women representatives were facing a lot of difficulties, harassment and humiliation at the hands of upper caste people and traditional power holders. Thus, there are so many factors upsetting the process of participation and level of performance of women in the Panchyat Raj Institutions. Broadly these factors may be categorized as (i) internal factor, and (ii) external Factor.

The internal factors which are affecting the process of women empowerment and participation are identified as: lack of awareness, experience, knowledge, skill, leadership quality, low level of education, lack of exposure, etc.

The external factors which affect the process of empowerment of women are: influence of family, caste, social outlook, patriarchy, etc. On one occasion one elected male representative remarked "what do the women folk know? Their job is to cook and serve; governance is not their job, it is our exclusive privilege." Patriarchal influence and traditional norms of our society hinder the path of women empowerment in the local government.

Conclusion:

In order to make participation of marginalized groups effective, efficient and successful, there is a need for vital change in traditional social attitude. There is also need for positive attitudinal change and mental make-up of the dominant folk in favour of women's participation. They should be given appropriate training to improve their knowledge base and capacity level relating to their rights and responsibilities. They should be made acquainted with the procedures of Panchayati Raj rules, regulations and

financial management. There is also need for launching many more awareness campaigns in favour of women's empowerment. Mass media, NGOs, Political Parties, Self Help Groups (SHGs) have a significant role to play in this context.

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Urbanization: The curses and cures

D. N. Mathur

Meaning of urbanization

Urbanization is a population shift from rural to urban areas leading to gradual increase in the proportion of people living in cities. It is a process by which new towns and cities are established. It is the process by which the existing cities inflate in size to accommodate more people who begin to live and work there. In simple terms, urbanization may be described as a process of increasing concentration of population in urban areas resulting from inflow of rural population.

Urbanization is a dynamic process which consists of a series of interrelated and integrated processes such as modernization, industrialization and sociological process of rationalization. It is often regarded synonymous with urban expansion. The statistical data establishes the factum of rapid growth of urban areas in India. Whereas in 1901, only 11.4% of the Indian population resided in urban areas, in 2001 it rose to 28.53% and touched the level of 31.16% in 2011. By 2030, it is expected to exceed 40%. As a necessary consequence thereof, the number of metropolitan cities increased from 23 in 1991 to 35 in 2001. Thus a predominantly rural culture is replaced by predominantly urban culture.

The global scenario is no different. The 2005 Revision of the UN World Urbanization Prospects Report says that the global proportion of urban population was 13% (220 million) in 1900 which rose to 29% (732 million) in 1950;and to 49% (3.2 billion) in 2005. The same report has projected that the figure is likely to rise to 60% (4.9 billion) by 2030. It is expected that from 2007 to 2050, the global urban population will nearly double (from 3.3 billion to 6.4 billion). It is further predicted that by 2050, about 64% of the developing world and 86% of the developed world will be urbanized.

Forms of urbanization

Urbanization may be planned or unplanned. The urbanization that takes place in execution of an advance planis known as planned urbanization. A plan prepared for military establishment is an example of planned urbanization. But unplanned urbanization is haphazard growth of urban population, which results from unscheduled random influx of rural population into urban areas.

Based on the style of architecture and planning methods, the urbanization may be of following kinds-

Inner-city urbanization: It means that new arrivals in cities shall no longer settle in the center.

Counter urbanization: It means the cities losing population to rural areas. This happens when after superannuation or retirement; the families prefer to move to villages to settle-down for the rest of life, instead of remaining in cities. It is a very common phenomenon in developed countries and is often seen in rich families.

Sub-urbanization: When the residential area shifts outward, this is called suburbanization.

Over-urbanization: It takes place when urbanization grows faster than the economic development. It renders the cities unable to provide adequate housing for rural migrants.

Reasons of urbanization

The expansion of urban area results from inflow of rural population into cities. It is propelled by people's perception of the differentials between urban and rural areas in respect to living standards, job opportunities, income generation, and access to services. The lure of better earning opportunities and decent lifestyle incite the rural population to shift to urban areas. Industrialization, technological advancement and globalization have created innumerable employment opportunities in urban areas and to avail them, many rural dwellers come to the city and finally settle down in the city itself. In due course, such people become inhabitants of the city. This leads to growth of urban population, warranting expansion of cities to accommodate them.

However, this is not the sole reason for the phenomenal growth of urban areas. There are several other reasons such as loss of farmland and pastureland due to development, forceful deprivation of lands by land grabs, ejectment resulting from a dispute over land rights, dispossession owing to mass and violent conflicts, etc. In all such situations, the evicted persons are rendered desperately needy to find an alternative dwelling place. They are therefore compelled to migrate to cities and settle there.

Not only this, the cities offer a large variety of services including specialist services not found in rural areas. These services require workers, resulting in better and diverse job opportunities. Aged people may be shifted to cities to avail advanced medical services for their health needs. The high quality educational opportunities existing in cities also contribute to quick urban migration. The urban areas also afford career opportunities to female members of society which is an added advantage. In contrast thereto, there is an apparent decline and stagnation in many resourcesin rural areas. The rural population, therefore, continues to suffer with inadequacies of services and quality of life, including access to a wide range of employment opportunities.

Effects of urbanization

Urbanization has brought about several social, economic and environmental changes. It has both positive and negative impacts. The advantage of urbanization is that it reduces the expenses in traveling owing to a strong public transport system, and improves opportunities for jobs, education, services, housing, etc. It offers greater variety of markets and goods than the rural areas. It plays a vital role in socio-economic progress of the country. The curses of urbanization are infrastructure congestion, monopolization, high overhead costs, etc. Moreover, it causes reduction of agricultural lands, disintegrates the age-old joint family system, and adversely affects public health and safety, etc. The disadvantages need to be addressed through the development and implementation of intelligent solutions.

Decline in agricultural activities

India is known as an agriculture based country. Even today, maximum share of its population resides in rural areas. Many concessions and subsidies are offered by the Government to the agriculturists with the intent to support them and to dissuade them from migrating to urban areas to explore other means of livelihood. However, urbanization has such a magnetic effect that the poor agriculturists and cultivators cannot resist it. They are tempted to move to cities, failing the efforts of Government since the urban areas afford alternative source of employment and offer opportunity for a 'white collared' job. Moreover, the rural youth has developed access to decent income modes in urban areas through non-agricultural job opportunities. This has adversely affected farming and has reduced the importance of agriculture. As a result, the percentage contribution of agricultural sector to the GDP of India has declined.

Not only employment opportunities, the urban areas also

provide to the smallholder farmers a ready market for their farm produce. Therefore, many smallholder farmers have switched over to growing of fast maturing crops such as spinach and tomatoes. The new mode of farming is advantageous, for it can be carried out on a small piece of land. However, the grimmer side is the huge quantities of pollution-free water which these fast maturing crops require for their healthy growth. To obtain adequate quantity of water is a task by itself on account of paucity of water being experienced all over the country. The availability of clean water, that too in sufficient quantities, is almost impossible. Therefore, the smallholder farmers need to struggle against these difficulties. Another hurdle is lack of opportunity for farmers to increase production by buying additional parcels of land, since use of several farmlands has been converted to residential purposes to sustain the load of urbanization.

The ready market has also supported 'dairy farming' which can be carried out on a small piece of land. The cows can be kept on small plots. There is no need to take them for grazing as their feed is available in the market in the form of bran. The cows are milked and raw milk so obtained is sold directly to the consumer. Therefore many farmers have opted for dairy farming on a zero grazing system. However, this system is also facing danger on account of increasing pressure from residential users and the complaints of non-farmer residents of the locality of foul smell that emanates from the stables.

Alteration of use of land

Mass migration of population from rural to urban areas led to abrupt increase in demand for lands in the cities to accommodate them. Whether it is for constructing residential accommodation for the relocated population, or for establishing industries, education hubs or hospitals, the availability of land is a prerequisite. A strong public transport system is the backbone of a city, for which land is needed. Similarly, preservation and development of the open spaces for parks, playgrounds, and recreational purposes is essential part of quality of life and health, for which land is necessary. Therefore, attempts were made to gain more and more land for urban area, for which the forests were mercilessly devastated by indiscriminate felling of trees and the cultivated and cultivable lands were encroached upon for expansion of cities. This caused land-use changes.

The lands situated on the rural-urban fringe were the first prey of land-use changes, as they were open for inclusion in urban areas more than those located in distant rural areas. On account of such vulnerability, the market price of fringe lands shot up.

The advantage of this factum was availed by the holders of the fringe lands as they sold their lands at a higher price and invested the consideration amount in purchase of cheaper and bigger parcels in further rural distances. Some landholders sold only a portion of their fringe land and utilized the proceeds in construction of rental residential houses in the remaining portion. In this manner they not only derived perennial benefit from the land in form of rent but also caused improvement of their land, which would thereafter fetch a better value when sold.

The studies have unveiled an alarming situation in respect of the land use and land cover changes in all mega cities which needs immediate attention. For instance, the city of Delhi is expanding towards its peripheral region due to conversion of rural regions into urban areas. During the period 1997 to 2008, the built-up area of Delhi has increased from 540.7 km^2 to 791.96 km^2 which constitutes 16.86% of the total city area (1490 km^2). It has mainly come from agriculture land, waste land, scrub-land, sandy areas and water bodies. Total area of water bodies has reduced by 52.9% (58.26 km^2 in 1997 to 27.43 km^2 in 2008).

Rapid urbanization is compelling expansion of cities in all directions. This is resulting in fast changes in the land-use pattern. The changes are more prominent on the urban-rural fringes. Undoubtedly, the land is limited. No extra land can be created. The ever increasing demand shall very soon render land unavailable. Hence it is necessary to critically review urban planning and to optimize the land-use. We have to utilize the available land in most efficient manner. More emphasis needs to be laid on preservation and management of urban greenery. Therefore, constant monitoring of the changes in urban land use and land cover is essential. It would be useful for understanding the various impacts of human activity on the overall ecological condition of the urban environment.

Fascination of better job opportunities and sources of income

Better job opportunities are available in the cities. There are numerous sources of employment, which are paying as also 'white collared'. Moreover, better earnings are also possible through small scale business like shop as also through involvement in construction sector within the area as new houses come up in their midst. This is the brighter side of urbanization. However, it lures the rural population so much as to persuade them to shift to urban areas. Hence the rural youth prefers to move to cities rather than continuing in the villages, which are deficient in both facilities

and opportunities. This shuffle has on the one hand enhanced the value of urban areas and the percentage contribution of urbanized sector to the GDP of India has significantly increased, but on the other hand has added to the problems of cities. Land is required to accommodate them and the provision of water, electricity, residence, transport, etc. is to be made for them. The cities are already running deficient on these fronts and are struggling to come out of it, but all measures of recovery are failing due to influx of huge rural population every year. Additionally, due to movement of population to urban areas, our 'agriculture-based country' is losing predominance in agriculture sector which is clearly reflected from substantial reduction of percentage contribution of agricultural sector to the GDP of India.

Collapse of age-old joint family system

India has witnessed a joint family system since ages. It used to be a family of which the eldest member was the Head. The Head used to manage all the affairs and took decisions on every issue relating to the family. The joint family was strongly interwoven.

The reasons of continuance of joint family for such a long time are attributable to several reasons, some of which relate to mental set-up of people and some to hard ground realities. The emotional attachment with ancestral land falls in former category and the benefits of joint family and illiteracy fall under the latter category.

In those days, people were intensely attached with their land. This affinity was out of sentiments instilled in the people. They used to consider the land as mother and the mother could neither be left alone nor could it be sold. The love and affection for ancestral land was so deep rooted that none of the joint family members could ever think of separating from it. People used to live together, jointly cultivate the land and reaped the benefits arising out of land in common. They were ready to survive on meager income arising out of the land but were not prepared to step out for availing better sources of income. The career or income was no consideration. People preferred to remain in joint family and to cultivate their lands, rather than stepping out to cities for enhanced earnings. The second Prime Minister of our country Shri Lal Bahadur Shastri recognized the importance of agriculturists in his well-known mantra 'Jai Jawan Jai Kisan'.

The joint family used to inculcate in a person a 'safe' feeling. He was freed from botheration of making arrangements for daily needs of the house-hold since the head of the family held that responsibility. In adversities,

he used to be supported by other members of the joint family, both morally and financially. He used to get appropriate advice from the senior members based on their experience, particularly in the matters the person was ignorant, for instance, care of female during her pregnancy, the issues related to delivery of child, and the matters related to post-birth child care. The inter-member bonding of a joint family was so strong that separation therefrom was out of imagination.

Most of the rural population was uneducated in those days; there fore career was no consideration for them. So was the income. They were satisfied with what ever they earned through cultivation. Moreover, they were almost ignorant about the decent life style that the cities offered. Most of them were so confined to their village that they had not seen the world outside it. Therefore there was no reason for them to move to cities, leaving their family and motherland. They preferred to continue in the joint family.

Gradually, as the literacy level increased, the educated rural youth came to know that their qualifications and talent would be better recognized and remunerated in cities rather than the villages. They also became aware of the fact that there is a scope to earn more if they move out to cities, leaving aside their emotions and affinity to motherland. A decent life style supported by high quality facilities and services awaits them in the cities. Their education could make available to them several opportunities of employment with handsome salary and decent 'white collared' job. The income from employment shall be fixed, regular and risk-free in contrast to income from agriculture which is neither certain nor regular. The cultivation process requires hard physical labour and concerted efforts leading to dependency on other members. The agricultural production every year is subject to many factors such as availability of good quality seeds, rains, irrigation facilities, fluctuating market price of the agricultural produce, etc. Not only this, an agriculturist is required to invest money first and subsequently recover it through sale of produce. However, the earning from employment is independent of these factors. It is a good and perennial source of income which is available in urban areas and is accessible to everyone who is qualified for a particular kind of employment. Thus the career and income considerations gradually gained momentum, inducing the rural youth to move to cities.

Particularly after Industrial Revolution in 1970s, and globalization in 1990s, the scenario underwent quick and radical changes. The aspiration of better career and earnings attained predominance over all other sentiments. The affinity with the motherland and the desire to remain in

joint family faded away. The temptation to adopt and enjoy the luring city-life was irresistible, hence the people started coming out of their villages to settle down in cities for better opportunities of career growth and attractive income.

The drain of rural population not only continued but also accelerated with the passage of time, year by year. This resulted in disintegration of joint family into micro families, each comprising only husband, wife and children. The parents, brothers and sisters were ousted. The joint family culture transformed into unitary family system. This recorded the dusk of the age-old joint family system and emergence of new micro family system. The micro families came to be settled in cities leaving their aged family members in the village. Their affinity with the motherland succumbed to their desire to adopt mesmerizing urban life.

Severance from society

Many residents of a village carry out their jobs elsewhere in the urban areas. They rarely depend on the villages to meet their income needs. However, for their employment, they are required to travel every morning from place of residence in rural area to their workplace in urban area and back. Mostly their return to village-based residence is late in the evening. Thus they remain busy throughout the day and after return, they suffer from fatigue. For this reason, they are unable to participate in community activities such as marriages, birthdays, felicitations, rejoicings, cultural functions, deaths and cremations, etc. These activities are necessary for the residents to access support within the community.

Creation of slums with unhygienic environment

Rapid rise in urban inhabitation due to influx of rural population wanting better job opportunities and decent life, has overcrowded the cities. Even after merging of urban-rural fringe lands into urban area, there is hardly any place to accommodate the persons, particularly the poor. The middle class somehow manages to survive in overpopulated cities but the poor is forced to live in unsafe conditions. They dwell in kachcha shelters which are illegally or informally erected on a small piece of land, commonly known as 'slums'.Most of the slum-dwellers are semi-skilled or unskilled workers who, attracted by economic opportunities in urban areas, land in the city but fail to find a job, rendering them unable to earn and afford housing in the city. The loss of farmland and pastureland due to development, forceful deprivation of lands by land grabs, ejectment resulting from a dispute over land

rights, dispossession owing to mass and violent conflicts, etc. are some more reasons contributing to fast growing slums. The United Nations Population Fund has estimated that the number of residents in slums had risen to about 863 million in 2012 from over 650 million in 1990.

The slums are devoid of basic amenities like water, road and electricity. Even adequate sunlight and fresh air is not available. The slum-dwellers are compelled to drink contaminated water. They go for urination and excrement in open land which not only embarrasses them but also creates a dirty, stinking, and unhygienic environment around them. They also suffer from malnutrition, mostly on account of poverty. Thus the health of slum dwellers is always at risk. They are susceptible to several kinds of deceases such as Cancer, heart disease, Tuberculosis, Cholera, breathing problems, etc. and hence the mortality rate is higher.

Deterioration of public health

Urbanization has direct nexus with public health. It has mixed effects on health patterns. For example, the children of urban areas run a lesser risk of malnutrition but a higher risk of obesity. Fast food and junk food is causing health decline. More diabetics are found in urban areas of our country as compared to rural areas. The eye-related problems are more frequently observed in the children of urban arrears rather that the children of rural areas. In general, major risk factors for chronic deceases are more prevalent in urban environments.

Increase in temperature

The vegetation and soil have tendency to retain water. The rural areas have very good vegetation cover. The soil therefore is not directly exposed to sun. The maximum solar energy received by rural land is consumed in evaporating of water from the green cover and hence rise of temperature is not as much as in the bald urban areas. This is a situation almost similar to coastal areas where temperature remains low as compared to other areas distant from the sea shore. On the contrary, the cities are devoid of vegetation cover and hence the soil has to face the scorching sun. Consequently, the soil loses whatever moisture it retained. It turns dry and hot. Moreover, most of the solar energy therefore is absorbed by buildings. It leads to higher surface temperatures. The heat released by vehicles, factories and domestic heating-cooling units adds to it. Therefore the cities are often 1 to 3 °C (1.8 to 5.4 °F) warmer than surrounding landscapes.

In the process of urbanization, the geographical extent of the city is increased by including the peripheral green fields. The vegetation cover is

then shaved off thereby rendering the surface soil open to sun heat. This is a negative effect of urbanization.

Air and water pollution

The urbanized mega cities suffer from the problem of air pollution, which is contributed by the industries, factories, vehicles and many other factors. When rain occurs in mega cities, it filters down the pollutants of air such as carbon-di-oxide and other greenhouse gases to the ground below. These chemicals run into rivers, streams and oceans, causing a decline in water quality and injuringthe marine ecosystems.

The Cure for Urbanization Related Curses: The Smart City

The concept of smart city is propounded to meet the challenges of sustainable development under the process of urbanization.

Meaning of smart city

Smart city may be described as a city well-equipped with basic infrastructure facilities and services, affords a decent quality of life, and a clean and sustainable environment through application of some smart solutions. It is capable of attracting investments, experts, and professionals. It allows simple and transparent online business and public services processes that make it easy to practice one's profession or to establish an enterprise and run it efficiently without any bureaucratic hassles.

The term has a vast connotation. It is not possible to offer a precise definition of the term on account of intricacies involved. Firstly, the term is understood differently in different cities and countries. Secondly, it depends on the desire of city residents as to what they perceive of a smart city and in what manner they want a city to be transformed into a smart city. The dwellers of one city may not appreciate the postulates of the dwellers of another city on the concept of smart city. Thirdly, several factors such as level of development and resources available also play a vital role. Unless a definition embraces all these aspects, it cannot be said to be perfect and this is exactly the constraint in defining a smart city. However, it may be said in nut-shell that a smart city refers to an urban area which is ecologically friendly, technologically integrated and meticulously planned, coupled with use of information technology to improve efficiency.

In spite of serious and almost unresolvable problem in defining a smart city, a smart city is measured by the integration of its infrastructure and the intelligent ways by which a challenge is tackled. A smart city puts emphasis on creating a system of networks to allow for a systematic flow of information and effective management of resources.

Need of Smart City

Population increase and economic growth results into rapid expansion of urban areas. Commensurate thereto, is the increasing demand of natural resources. There are several problems associated with it such as need of additional infrastructure, environmental pollution, destruction of ecological balance and scarcity of natural resources. The fast growing urban population is posing serious challenges to the society. There is irreparable loss of the cultivable lands. There is destruction of fauna and flora which has disturbed the ecological balance. There is deterioration of natural vegetation cover leading to climatic changes including irregular cycle of weather, reduction of rainfall, and decline in oxygen to carbon-di-oxide ratio. Pollution is on the rise affecting the health of all living creatures including humans, animals and plants. The conversion of rural areas into urban areas through development has actually affected the whole ecosystem.

In spite of all above adversities, it may be said without any hesitation that urbanization is a boon to the society as it tends to improve the life-style of the humans. However, it must be systematic, planned, controlled, and coordinated. The haphazard urbanization, which our country has so far witnessed, has already cost us dearly and we may not be able to sustain any further damage caused thereby. Before we reach the 'point of no return', there is dire need of urbanization that is steady, systematic, strategic and sustainable, paying attention to its implications and taking steps to minimize them. The concept of 'smart city' targets the development of cities in that manner.

Concept of Smart City: The Smart City Mission

The concept of smart city is of very recent origin in India. The credit is attributable to present Government headed by Prime Minister Shri Narendra Modi, which had put forth the idea of smart city and brought out a document "Smart Cities-Mission Statement and Guidelines" for development of cities into smart cities. Appreciating the difficulty in defining a smart city, the document says that there is no universally accepted definition of a smart city. It means different things to different people. The conceptualization of smart city, therefore, varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. A smart city would have a different connotation in India than, say, in Europe. Even in India, there is no one way of defining a smart city.

The 'Smart City Mission' is an innovative concept. It is launched with the intent to ensure economic growth and improve the quality of life of people. The objective is to promote cities which provide core infrastructure and give to its citizens, a decent quality of life and clean and sustainable environment by application of smart solutions. The focus is on sustainable and inclusive development.

The Mission will cover 100 cities and its duration will be five years i.e. from financial year 2015-16 to financial year 2019-20.

Core infrastructure elements in a smart city

The basic infrastructure necessary for a making a smart city includes assured water and electricity supply, sanitation and solid waste management, efficient urban mobility and public transport, robust IT connectivity, e-governance and citizen participation, safety and security of citizens and health and education. This list is however illustrative and it is permissible to add more applications. These core infrastructure need to be developed as to provide to the citizen a decent life style with a clean and sustainable environment.

Process for development of smart city

The process envisaged for development of a smart city embraces four kinds of activities, viz.

(i) City improvement i.e. retrofitting - Under retrofitting, the deficiencies in an existing built-up area are attended and improved in a planned manner so as to meet the parameters of smart city;

(ii) City renewal and redevelopment-Renewal and redevelopment involve reconstruction of already built-up area. Such area is replaced in a manner as to enable co-creation of a new layout with enhanced infrastructure in accordance with the norms of smart city;

(iii) City extension-It involves innovative planning and development of green-field areas located on the periphery of a city into a smart city;

(iv) Pan-city development-It envisages application of selected smart solutions such as use of technology, information and data to the existing city-wide infrastructure.

No prescription is made for any particular model to be adopted by the smart cities. Each city has to formulate

its own concept, vision, mission and plan (proposal) for a smart city that is appropriate to its local context, resources and levels of ambition.

The above processes, particularly the city extension, are the steps forward to what is commonly known as urbanization. Urbanization is one of the most important dimensions of economic, social and physical change, particularly in a country like ours. It provides opportunities for employment, better housing, education, knowledge and technology transfer, and ready markets for the agricultural products, but at the same time, it puts enormous stress on natural resources, existing social services and infrastructure. Thus, urbanization has both positive and adverse effects on land use planning, livelihood and environment in rural-urban fringes.

Method for achieving comprehensive development of smart city

The comprehensive development of smart cities is sought to be achieved by-

(a) promoting mixed land use of the lands close to one another so as to make the land use more efficient.;

(b) extending housing opportunities to all;

(c) reducing congestion, air pollution and resource depletion;

(d) boosting local economy, promoting interactions and ensuring security;

(e) creating road network for vehicles and public transport, as also for pedestrians and cyclists;

(f) preserving and developing open spaces such as parks, playgrounds and recreational grounds so as to enhance the quality of life of citizens, and reduce the urban heat effects

(g) promoting a variety of transport options;

(h) making governance citizen-friendly and cost effective;

(I) increasing reliance on online services to bring about accountability and transparency, especially using mobiles, to reduce cost of services;

(j) providing services without having to go to municipal offices;

(k) form e-groups to listen to people and obtain feedback and use online monitoring of programs and activities with the aid of cyber tour of worksites;

(l) giving an identity to the city based on its main economic activity, such as local cuisine, health, education, arts and craft, culture,

sports goods, furniture, hosiery, textile, dairy, etc; and

(m) applying smart solutions to infrastructure and services in area-based development in order to make them better.

Smart solutions

An illustrative list of smart solutions is given in "Smart Cities-Mission Statement and Guidelines" referred supra. Accordingly, the smart solutions have been classified into six categories viz. E-governance and Citizen Services, Waste Management, Water Management, Energy Management, Urban Mobility and Others. The E-governance and Citizen Services include public information, grievance redressal, electronic service delivery, citizens' engagement, video crime monitoring, etc. Waste Management includes waste to energy and fuel, waste to compost, treatment of waste water, recycling and reduction of C&D waste, etc. Water Management includes smart meters and management, leakage identification, preventive maintenance, water quality monitoring, etc. Energy Management includes smart meters and management, renewable source of energy, efficient energy and green buildings, etc. Urban Mobility includes smart parking, intelligent traffic management system and integrated multi-modal transport etc. Others include tele-medicine and tele-education, incubation/trade facilitation center, skill development center, etc.

To conclude, a quote of Michael Lipton "the most important class conflict in the poor countries of the world today is not between labour and capital. Nor is it between foreign and national interests. It is between rural classes and urban classes. The rural sector contains most of the poverty and most of the low-cost sources of potential advance; but the urban sector contains most of the articulateness, organization and power. So the urban classes have been able to win most of the rounds of the struggle with the countryside."

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Need of Civil Service Reforms in India

B. Venkatesula Reddy

Introduction

Civil service is a relatively a new term used to describe an old governmental feature that is becoming increasingly important in modern political systems. The phrase was first used in British administration in India and was popularized by Sir Charles Trevelyan a little more than a century ago. When the principle of open competitive examination was introduced in Great Britain in 1854, the phrase 'civil service' was also carried over and was applied to the officials serving the state in a professional capacity, except for those in the military and judicial services. Of course, equivalent bodies of officials have served states throughout history, long before the term 'civil service' was applied to them.

The definition does place emphasis on the professional character of the service as against work performed for the state on a sporadic, voluntary, or forced basis. As used in Great Britain, and to a certain degree elsewhere, the term 'civil service' refers to officials serving the central government or its agencies rather than local units of government. The term itself does not specify conditions as to professional preparation, methods of recruitment, social and economic origins, or other crucial matters, but it is now customarily associated with a merit system, as contrasted with a patronage system, and with a service open to all citizens on the basis of talent and proved capacity.

Despite the vagueness in accepted definition and variations in its usage, 'civil service' does identify the expanding corps of trained manpower that must be maintained by every modern polity to carry out governmental functions. The trend is world-wide, despite differences in cultural, political, historical, geographic, and other factors, for the scope and range of these governmental

functions appear to be increasing. The result is usually described by such terms as 'welfare state', 'administrative state', and 'big government'. Inevitably, the civil service plays a crucial role in the operation of modern governmental systems, whether in Western or non-Western states, in countries in the communist or non-communist blocs, and in developed or developing nations. In all of them, the civil service is the core of modern government, growing in its power position vis-à-vis other political organs and therefore posing grave problems of control and accountability. At the same time that its contributions have become more essential, the question of the proper placement of the civil service in the governmental system has grown more difficult. While the external relationships of the civil service have been changing, its internal characteristics have also been modified in ways that transcend differences in the political systems generally. A consistent trend is that the proportion of the total work force that is encompassed by the civil service has been growing in most countries. Another is that the requirements of the civil service call for the services of a constantly expanding variety of occupational and technical specialists, representing all or most of those available in the society. These developments, in turn, have led to a trend toward professionalization among civil servants that affects their attitudes and behavior in ways that are significant both for the conduct of civil service activities and in the relationships of the civil service with other political groupings.

The institution of civil service has rendered yeoman service to the overall socio-economic development of the country. It was also at the forefront of the development process right from the 'commanding heights' regime to the 'liberalization and de-regulation' era. It has not only played an important role in designing and implementing policies, it has also ensured basic service delivery at the cutting edge of government-citizen interface.

Civil service for governance stems from the following:

- Service presence throughout the country and its strong binding character.
- Non-partisan advice to political leadership in the midst of political instability and uncertainties.
- Administrative and managerial capacity of the services.
- Effective policy-making and regulation.
- Effective coordination between institutions of governance.

- Leadership at different levels of administration.
- Service delivery at the cutting edge level.
- Provide 'continuity and change' to the administration.

In recent times, there have been accelerated changes globally, brought about by technological advances, liberalization, greater decentralization and social activism. A primary challenge before the government is to exploit the advantages of globalization and international interdependence to foster economic growth while preserving sovereignty. The ramifications of global changes are being felt by the government in the form of increasing citizen expectations for better governance through effective service delivery, transparency, accountability and rule of law. The civil service, as the primary arm of government, must keep pace with the changing times in order to meet the aspirations of the people.

Many changes took place in the Indian civil services since Lord Cornwall is introduced it in India. The Indian civil service was created to foster the idea of unity in diversity. The service was expected to give continuity and change to the administration amidst the changing political scenario and turmoil affecting the country. By and large, the Indian civil service has played the part of giving this continuous support to the nation. But what is appalling and needs a serious consideration is the element of adaptability to 'change'. It can be said that the Civil Service as a whole has maintained its status quo in spite of sweeping changes in social and economic scenario. Some may argue that it is the resilience of the civil service, but there are others who contend that the Indian civil service has not been able to deliver service based upon the expectations of the people or the founding fathers of the Constitution.

The Indian Administrative Service enjoys considerable status in the society. 'The bureaucracy is independent, enjoys a very high social status and is, above all, committed to accomplishing its own institutional mission.' The high status is because of two reasons: first, the meritocracy of the Indian Administrative Service commands respects in the society, and second, the Indian Administrative Service officers occupy all the control posts in the state structure. Since the state is interventionist and affects the lives of its citizens in myriad ways, the Indian Administrative Service officers are important in the society.

Civil Service at Present

At the outset, it may be pertinent to refer to the pattern of civil service structure prevailing in India. The most important services are the All-India services, such as the Indian

Administrative Service, the Indian Police Service and the Indian Forest Service. The members of the All-India services are recruited by the central government, trained under the directions of the central government and allotted to various union territories and states by the central government. Their service conditions are also largely regulated by the central government. Members of these services man the most important policy and administrative positions in the central government and union territories as well as the states. Immediately after the training period is over, officers of the All-India services are allotted to their cadres in state or union territories and normally an officer has to spend his entire administrative career working in his encadred state, except for a possible brief (five years or so) stint in the central government. Despite working in different states, members of an All-India service develop a unifying bond of belonging to 'one' service and this structural homogeneity creates a sort of administrative unity in a diverse federal setting such as India's. Next in importance to the All-India services come the central services such as the Indian Railway Traffic Service, Indian Post and Telegraph Service, Indian Revenue Service and Indian Audit and Accounts Service, the personnel of which man the major central government professional or technical departments which function throughout the country.

The state governments in India have their own services for administering different functional areas. These may relate to general administration, police, accounts, cooperatives, commercial taxes, agriculture, economics and statistics, education and the like. In addition to the All-India, central and state services, there are a large number of segmented services which comprise personnel employed by public undertakings and other semi-government organizations which may not, by definition, form part of the 'civil services' per Se, but are important components of the total public service system.

The various All-India, central and state services may be functionally divided into two broad categories, that is 'generalists' and 'specialists'. The generalist services include the most important All-India service or, specifically, the Indian Administrative Service, the central and state secretariat services and the state administrative services. The personnel of these services occupy both regulatory and developmental positions and their dominance in the policy formulation and implementation positions has been a major factor in characterizing the nature of the Indian Civil Service as 'generalist'. The specialist services comprise the personnel performing specialized tasks or functions. These services could be further sub-grouped

as 'professional' and 'technical'. The former pertain to such professional services as police, taxation, education, judicial, statistics and accounts, while the latter relate to technical services like the engineering, medical, agriculture and veterinary sciences. While recruitment to the 'generalist' and 'professional' services is based on a system of liberal education, for 'technical' services, a background in the specific technical area is a pre-requisite. Further, within the 'professional' service sector, there are services such as labour welfare, judiciary, primary and secondary education and statistics which recruit people having specialized educational degrees in the specific subject areas—even though some of these subject areas would fall within the parameters of 'liberal education'. However, personnel of certain professional services such as accounts, taxes and police, have generally had a liberal education back-ground; it is only later that they develop the 'professional' specialization as a result of post-entry training imparted to them in their respective spheres of functioning and in-service acquisition of specialized experience. From the point of view of the specific training needs of various services, the generalist services and a majority of professional services are generally imparted 'administrative training', while certain 'professional' services especially those who do not possess any academic qualifications in their 'chosen' profession, are imparted 'administrative' as well as 'specialized' training; for the 'technical' services, provisions are generally made for imparting in-service orientation training to their personnel. In India, training institutions and methods have developed with a view to cater to the multifarious training requirements of almost all important services. However, the major focus in the Indian training system has been on imparting training to generalist and professional services, while the technical services have relied mostly on their strong foundation of formal specialized educational system; the question of imparting 'administrative' training to the technical service personnel has received very little attention so far.

In recent years, there is evidence that the status of the Indian Administrative Service is on the wane. This is because, as the study by the Lal Bahadur Shastri National Academy of Administration states, 'Over the years whatever little virtue the Indian Administrative Service possessed-integrity, political neutrality, courage and high morals-are showing signs of decay. Unfortunately, many Indian Administrative Service officers are accepting a diminished role for themselves by becoming agents of exploitation in a state structure which now resembles more the one in the medieval period-authoritarian, brutal, directionless and callous to the needs of the poor'.

Some of the problems affecting Indian Civil Services are: (i) Lack of professionalism and poor capacity building. (ii) Inefficient incentive systems that do not appreciate upright and outstanding civil servants but reward the corrupt and the incompetent. (iii) Outmoded rules and procedures that restrict the civil servant from performing effectively. (iv) Systemic inconsistencies in promotion and impanelment. (v) Lack of adequate transparency and accountability procedures – there is also no safety for whistle blowers. (vi) Arbitrary and whimsical transfers– insecurity in tenures impedes institutionalization. (vii) Political interference and administrative acquiescence and (viii) A gradual erosion in values and ethics.

Need of Civil Service Reform

The purpose of 'reform' is to reorient the Civil Services into a dynamic, efficient and accountable apparatus for public service delivery built on the public service ethos and values of integrity, impartiality and neutrality. The reform is to raise the quality of public services delivered to the citizens and enhance the capacity to carry out core government functions, thereby, leading to sustainable development.

Civil Service Reform needs to strengthen administrative capacity to perform core government functions. These reforms raise the quality of services to the citizens that are essential to the promotion of sustainable economic and social development. Civil Service Reform can contribute to macroeconomic stabilization by restoring budgetary stability, strengthening revenue collection, managing aid effectively, and improving development performance through proper implementation of investment frameworks and the management of public expenditure plans and programmes. The reform can contribute to the design and implementation of an equitable programme of social development. Enhancing the capacity of civil servants and improving their morale are critical to all these functions.

A well-functioning civil service helps to foster good policy-making, effective service delivery, accountability and responsibility in utilizing public resources which are the characteristics of good governance. 'Good Governance' is being used as an all-inclusive framework not only for administrative and civil service reform, but as a link between Civil Service Reform and an all-embracing framework for making policy decisions effective within viable systems of accountability and citizen participation. Administrative reform focuses on rationalizing structures of government. Governance reform tends to refer to the improvement of

legal and policy frameworks to create proper decision making environment; participatory systems for elements of civil society to become actively involved in policy and programme formulation and their implementation; and an effective and transparent system and process for control and accountability in government activities. Civil Services reform cannot be seen in isolation and it has to be undertaken along with administrative reforms for effective results.

Conclusion

Civil service is a relatively a new term used to describe an old governmental feature that is becoming increasingly important in modern political systems. Although comprehensive reform that involves governance, the civil service, and civil society is ideal, it requires sustained commitment from political and administrative leaders. It is also too complex to implement all at once. Few countries have undertaken comprehensive reforms and there are mixed results. The challenge lies in finding linkages among the governance, civil service and civil society components, determining which require priority attention.

Civil Service Reform is a deliberate change effort by government to improve its capacity to effectively and efficiently execute policies. Reforms in the civil service across the globe have occurred ever since the Chinese invented bureaucracy-they are a continuous process with no general starting point, and equally no end.

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Fiscal Health of Small and Medium Municipalities of West Bengal: A Case Study of Four Municipalities

Mahalaya Chatterjee, Arup Ratan Misra

Abstract

In India, for investments in infrastructure for basic municipal services, national policy encourages private participation – pushing the municipalities into the competition for attracting private sector investment – for which municipalities require creditworthy fiscal health. It is found that the provision of water supply, sewerage, storm water drainage and solid waste management in four small and medium municipalities selected for the case study is considerably below the national service level benchmarks. In order to assess these municipalities' ability to attract non-government investment in the respective infrastructure necessary for providing these basic municipal services, this paper evaluates their fiscal health. For the purpose of this evaluation, after comparing the methods available in the literature in terms of the purpose, scope and limitation of data availability in the context of the present study - Financial Trend Monitoring System (FTMS) by International City/County Management Association (ICMA) (1994) has been used with pragmatic selection of some of the prescribed financial indicators and modifications in the light of the measures suggested by Mathur and Ray (2003).

In order to select the representative municipalities for this case study, firstly, small and medium municipalities of the state are divided into two homogeneous groups, viz. those within Kolkata Metropolitan Area (KMA) and those outside the Kolkata Metropolitan Area (Non-KMA) asthey differ in many factors affecting the municipal fiscal health; secondly, each of these groups is sub-dividedinto small municipalities and medium municipalitiessinc, on national basis, both the level of services and financial strength of municipalities decrease with the decrease in the size of the municipalities; lastly, from each of

these four sub-groups, the most audited municipality is selected to get the highest reliability in financial data.

Though fiscal health is only one of the factors to determine municipal creditworthiness, it is an important one. In this study, it is found that in the selected medium municipality group the non-KMA municipality, Chakdah municipality, is solvent but its KMA counterpart is not, and in the small municipality group the reverse is the case. But in all these cases it is found that without government grant, the revenue of the municipalities are in a precarious state. Hence municipal revenue generation needs a boost.

Key Words: Basic Services, Fiscal Health, Municipalities, West Bengal.

1. Introduction

In India the 74th Constitutional Amendment Act (CAA), 1992 has assigned the municipalities several functions for delivering urban services but has not empowered municipalities to determine tax base or tax rate–these rest with the state governments; there fore, municipalities depend too much on intergovernmental transfers (Mathur2006). The revenue expenditures for municipal basic services are met out of the municipalities' own revenue sources, and supplemented by government revenue grants – whereas traditionally, the investment in infrastructure is mostly fundedby government capital grants. Till the decade of 1980s, loans were available from public financial institutions at concessional terms for this purpose but under the regime of economic liberalization, municipalities are to borrow at competitive market rates of interest. Five Year Plans have begun to include cost recovery conditions for grants (Kundu 2001, 2006). But investment in urban infrastructure is distressingly inadequate (GOI 2011). Municipalities are required to access alternative infrastructure financing modes like bank loans, public-private-partnership and municipal bonds - which essentially require fiscal health of municipalities to be sound enough to attract investors. It is observed that this precondition is far more difficult to fulfil for the small and medium municipalities in India (Kundu 2001, 2006).

The West Bengal Municipal (Amendment) Act 2006 also causes the same wide disparity between municipal functions and finances. However, based on the inter-governmental transfer criteria as laid down in the Report of the 3rd State Finance Commission, West Bengal ensures that government grants are distributed in an equitable and inclusive manner - but that does not enable the municipalities to leap frog into heavy capital investment to improve facilities for enhancing future income (Banerji et al. 2013).

2. Research Problem And Organization Of The Study

2.1 Research Problem

This paper evaluates the fiscal health of the small and medium municipalities of West Bengal in order to assess their ability to attract the necessary capital investment in infrastructure for the municipal basic services. An appraisal of the existing standard of these services in these municipalities has been done to set the backdrop of this evaluation by revealing the degree of distress in the provision of these services in these municipalities.

2.2 Scope of the Study

In conformity with the Urban Development Plans Formulation and Implementation (UDPFI) by GOI (1996) and Integrated Development of Small & Medium Towns (IDSMT) Schemeby GOI (1995) 'small towns' and 'medium towns' have been defined in this study as towns/cities having population 'less than 50,000' and '50,000 - 5,00,000'respectively [the terms 'town' and 'municipality' have been used interchangeably here though are not exactly synonymous]. And in agreement with the governmental identifications (e.g. in GOWB 2013), water supply, sewerage, storm water drainage and solid waste management have been considered here as the 'urban basic services'. It is the small and medium municipalities of West Bengal whose fiscal health has been focused here through a case study.

2.3 Research Methodology

As a backdrop to the evaluation of the fiscal health of the small and medium municipalities, the status of the provision of the urban basic services in these municipalities is appraised on the basis of the Census data regarding the reach of the services and the local government self-assessment(GOWB 2013).

The literature offers a number of methods of evaluating municipal fiscal health. The Ten-Point Test of Fiscal Condition (Brown 1993) yields a snapshot of a local government's fiscal health. The Fiscal Capacity Analysis(Alter et al.n.d.) provides a budgetary tool for analyzing budget trends necessary for projecting budgets. Andthe Financial Trend Monitoring System (FTMS) by The International City/County Management Association (ICMA) prescribesa set of 36 indicators useful to decision makers regarding the fiscal health of ULB (Groves and Valente 1994). The measures evaluate the fiscal health of the ULBs on the basis of their revenues, expenditure, liquidity, and debt structure. For revenues, analysts include all types of income such as tax revenue, fees and charges, and inter-governmentalaid. Expenditure includes debt service,

general expenditure and capital expenditure for projects. Liquidity indicators based on total cashand investments in the general fund indicate how able a municipality is to meet its short-term obligations such as its payroll, bills, and other current expenditures. Debtstructureindicators focus on the long term debt and include measuring the ability of the municipality to repay its general obligation debt from own sources of revenue comprising mainly the property tax revenues (Honadle et al. 2004).

The selection of the most suitable method of evaluation depends on the objective of the study and the availability of data. So far as the objective of the study is concerned, - if one is interested for the comparison of fiscal health among municipalities Brown's test would suit the purpose, if a longitudinal perspective is focused FTMS by ICMA would be preferred and if an analyst is interested in projecting expenditures Fiscal Capacity Analysis tool would be opted for (Honadle and Llyod-Jones 1998). Thus considering the objective, purpose, scope of the study along with the limitation of data availability in the context of the present study a pragmatic selection of some of the financial indicators of FTMS by ICMA has been depended upon with modifications in the light of the measures suggested by Mathur and Ray (2003).

2.4 Selection of municipalities for case study

In order to select the representative municipalities for this case study - firstly, small and medium municipalities of the state are divided into two homogeneous groups – viz. those within Kolkata Metropolitan Area (KMA) and those outside the Kolkata Metropolitan Area (Non-KMA) as they differ in many factors affecting the municipal fiscal health viz, population density, level of economic activities, average income level of the municipal citizenry and volume of government grants; secondly, each of these groups is sub-divided into small municipalities and medium municipalities since a national level study by Kundu (2001) finds that both, the level of services provided by the municipalities and their financial strength in terms of revenue dependence on upper tier tiers decrease with the decrease in the size of the municipalities; lastly, from each of these four sub-groups, the municipality which has been audited for the maximum number of years so far, is selected to get the highest possible reliability in financial data of the municipalities within the domain allowed by their availability constraints.

From KMA - Pujali Municipality (small) and Bhatpara Municipality (medium) and from non-KMA - Taki Municipality (small) and Chakdah Municipality (medium) are selected for case study. (Table 1)

Table 1: No. of years of audit of small and medium municipalities in West Bengal

Zone-wise Group	Total Nos.	No. of years of Audit of Accounts till January 31st , 2014						
		0 yr.	1yr.	2yrs.	3 yrs.	4 yrs.	5 yrs.	6 yrs.
Non-KMA Small	34	24	7	2	-	1(Taki)	-	-
Non-KMA Medium	48	31	13	1	1	1	1 (Chakdah)	-
KMA Small	2	1	-	-	1 (Pujali)	-	-	-
KMA Medium	36	14	8	5	3	3	2	1(Bhatpara)

Source: Computed on the basis of Report of the ELA on ULBs 2007-08 & 2008-09 and interview with the Local Audit Department, Office of the Principal Accountant General (General &Social Sector Audit), W.B.

2.5 Data

For appraisal of basic urban services, data showing the households accessing the services from the Census Reports (1991, 2001 and 2011) and data showing the existing standard of services from the notification in The Kolkata Gazette (2013) by the Government of West Bengal have been relied upon. The evaluation of the fiscal health of the municipalities has been made on the basis of the budgets of those municipalities. Necessary interpretations of the terms of municipal finance in the context of West Bengal have been made as per The West Bengal Municipal Act 1993 and West Bengal Municipal (Finance and Accounting) Rules 1999. Thus all the data used in this study are secondary in nature.

3. Urban Basic Services In Selected Municipalities

Table 2: Percentages of households accessing urban basic services in case study towns

Urban Basic Services	Forms	Chakdah			Bhatpara			Taki			Pujali		
		1991 (%)	2001 (%)	2011 (%)	1991 (%)	2001 (%)	2011 (%)	1991 (%)	2001 (%)	2011 (%)	1991 (%)	2001 (%)	2011 (%)
Water Supply	Tap –within premises	NA	**8.26**	**35.34**	NA	**36.67**	**51.52**	NA	**3.96**	**5.96**	NA	**0.07**	**21.42**
	Tap – near premises & away	NA	22.58	31.38	NA	41.36	37.12	NA	45.21	49.14	NA	3.06	52.93
	Tap -total	**6.36**	30.84	66.72	85.85	78.03	88.64	19.25	49.17	55.10	NA	3.13	74.35
	Handpump/ Tubewell	89.79	66.36	31.64	5.34	18.76	9.59	77.34	49.75	41.80	NA	96.50	25.17
	Others	1.00	2.79	1.64	1.63	3.20	1.77	0.35	1.08	3.10	NA	0.36	0.48
Toilet	(all forms in total)	**82.21**	**95.46**	**98.09**	**86.30**	**89.66**	**98.90**	**60.05**	**80.74**	**97.01**	NA	**55.48**	**90.32**
Sewage	(all forms in total)	NA	**17.66**	**30.82**	NA	**75.05**	**98.90**	NA	**26.75**	**97.01**	NA	**20.79**	**90.32**

Source: Census of India- 1991 [Table: H-5 (S)], 2001[Tables:H-8, H-10 and H-12] and 2011[Tables:HH-8, HH-9 and HH-11]

As per Service Level Bench marking in urban basic services by MoUD, GoI (2009) only direct tap water connection to the households would be counted as the minimum level of service. But relevant data with this level of segregation is not available in 1991 census report. It is found that the situation of access to tap water supply has improved in general in these towns except in Bhatpara; regarding Toilet and Sewage network coverage, as per the said Service Level Bench marking, any form of service is counted as service and the benchmark of the access of these services in all size-class of towns/cities is 100% (Table 2)

Performance indicators of the urban basic services other than the service coverage indicators in case study score far more low (Table 3).

Table 3: Existing levels of Urban Basic Services in case study municipalities vis-à-vis Service Level Benchmarks by MOUD, GOI

	BASIC SERVICES STANDARDS INDICATORS	Service Level Benchmarks [GOI (2009)]	PUJALI Small KMA Pop: 48529	TAKI Small Non-KMA Pop:43412	BHATPARA Medium KMA Pop: 474000	CHAKDAH Medium Non-KMA Pop: 97662
	WATER SUPPLY					
1.	Coverage of water supply connections	100%	30%	0%	35%	28%
2.	Per Capita availability of water at consumer end	135 Lpcd	25 Lpcd	0	95 Lpcd	39 Lpcd
3.	Extent of metering of water connections	100%	83%	0%	0%	0%
4.	Extent of Non-Revenue Water	20%	44%	100%	20%	37%
5.	Continuity of water supply	24 Hrs/Day	5 Hrs/Day	0 Hrs/Day	10 Hrs/Day	6 Hrs/Day
6.	Efficiency in redressal of customer complaints	80%	45%	0%	80%	80%
7.	Quality of water supplied	100%	0%	0%	0%	82%
8.	Cost recovery in water supply services	100%	65%	0%	20%	45%
9.	Efficiency in collection of water supply related charges	90%	99%	0%	0%	90%
	SEWERAGE					
1.	Coverage of Toilets	100%	100%	100%	78%	100%
2.	Coverage of Wastewater network services	100%	0%	0%	18%	0%
3.	Collection efficiency of wastewater networks	100%	0%	0%	50%	0%
4.	Adequacy of wastewater treatment capacity	100%	0%	0%	50%	0%
5.	Extent of re-use and recycling of treated wastewater	20%	0%	0%	10%	0%
6.	Quality of wastewater treatment	100%	0%	0%	95%	0%
7.	Efficiency in redressal of customer complaints	80%	0%	0%	25%	92%
8.	Extent of cost recovery in wastewater management	100%	0%	0%	10%	0%
9.	Efficiency in collection of sewerage charges	90%	0%	0%	0%	0%
	STORM WATER DRAINAGE					
1.	Coverage of Storm Water Drainage Network	100%	60%	5%	55%	43%
2.	Incidence of water logging/ flooding	0	0	0	0	20
	SOLID WASTE MANAGEMENT (SWM)					
1.	Household level coverage of SWM services	100%	5%	30%	5%	0%
2.	Efficiency of collection of municipal solid waste (MSW)	100%	7%	100%	75%	0%
3.	Extent of segregation of MSW	100%	0%	0%	0%	0%
4.	Extent of MSW recovered	80%	5%	0%	0%	67%
5.	Extent of scientific disposal of MSW	100%	0%	100%	0%	0%
6.	Extent of cost recovery in SWM services	100%	0%	0%	0%	0%
7.	Efficiency in collection of SWM charges	90%	0%	0%	0%	0%
8.	Efficiency in redressal of customer complaints	80%	8%	5%	65%	73%

Source:Kolkata Gazette Notification (2013)

4. Evaluation Of Fiscal Health

Financial Trend Monitoring System (FTMS) tool prescribes36 indicators to evaluate different dimensions of fiscal health of municipalities but it is not obligatory to use all the 36 indicators in all cases, rather a subset of these 6 indicators may be used depending on the data availability along with the requirements of the analysis being done. In addition, some meaningful modifications may also be made if the situation so demands. We analyze for this study the following FTMS indicators only. Some of them have been modified with minor adjustments for the inadequate data availability. Later on, these indicators are plotted over a recent eight year span to get their recent trends for the selected municipalities. Table 4 lists and defines these indicators.

Table 4: Indicators used for FTMS in this study

No.	Indicators	Formula
1	Population	Population (exponential growth assumed)
2	Revenue Per Capita (Rs.)	Total Revenue Income (at Constant Price)/Population
3	Intergovernmental Revenue Ratio (%)	(Revenue Income from Govt./ Total Revenue Income)x100
4	Own Tax/Total Revenue Income (%)	(Own Tax/Total Revenue Income) x100
5	Property Tax Revenue Per Capita(Rs.)	Property Tax Revenue (at Constant Price)/ Population
6	Revenue Surplus/Total Revenue (%)	(Revenue Surplus/Total Revenue) x 100
7	Expenditure Per Capita (Rs.)	Total Revenue Expenditure (at Constant Price)/Population
8	Establishment Exp./Total Revenue Exp. (%)	(Establishment Exp./Total Revenue Exp.) x 100

Source: Adapted from Groves and Valente (1994)

Further, due to inadequate availability of appropriately disaggregated data, a convenient subset of the Mathur & Ray (2003) prescribed list of municipal financial performance gradation indicators has been applied for this study (Table 5).

Table 5: Applied Gradation of Municipal Financial Performance Indicators

	Favourable	Good	Moderate	Poor
Revenue Surplus/Total Revenue Income (%)	>40%	>25%	>15%	<15%
Capital Expenditure/Total Expenditure (%)	>40%	>20%	>10%	<10%
Capital Grants+ Rev. Surplus/ Capital Expenditure	>0.75	>0.5	>0.25	<0.25
Own Tax/ Revenue Receipts (%)	>70%	>50%	>25%	<25%
Revenue Grants/ Revenue Receipts (%)	<10%	<25%	<50%	>50%
Establishment Exp./Revenue Exp. (%)	<40%	<60%	<75%	>75%
Cost Recovery: Water (%)	>75%	>50%	>25%	<25%
Collection Efficiency: Property Tax (%)	>75%	>50%	>30%	<30%

Source: Adapted from Mathur& Ray (2003)

In accordance with the West Bengal Municipal Act 1993 (as amended in 2006) and the West Bengal Municipal (Finance and Accounting) Rules 1999, the municipal fund comprises own sourced revenue, shared revenue, grants and assistance from governments and loans obtained from public financial institutions and nationalized banks or such other institutions as the State Government may approve. Property tax is the main source of tax revenue. Plan-sanction fees, mutation fees and water charges are the main sources of non-tax revenues. The State Government releases administrative grants for their revenue expenditures. And grants and assistances for the developmental activities are released by the State Government and the Central Government under specific schemes or projects. The loans raised from different sources with prior approval of the State Government are utilized for the execution of different schemes and projects.

Chakdah Municipality

This medium size Non-KMA municipality is in Nadia district - established as early as in 1886 and now has 21 wards. The economy of the district being agriculture based, cropping intensity is very high - causing intense pressure on land. There are various other allied economic activities - like animal husbandry, floriculture, horticulture, inland fisheries, sericulture, several artisan based traditional cottage industries etc. Agro processing activities- like jute diversification and food processing have emerged as some promising industries. There is emergence of retail and service sector to meet the urban lifestyle needs. Inhabitants work in neighboring areas and in Kolkata. In the Chakdah municipality small businesses of retail and service sector are growing fast, constitutingits major economic base.

Table 6: % of Total Expenditure on some principal items: Municipality vis-à-vis district & state averages (Financial Year 2011-12)

Area	Gen .Adm.&Collection Charges	Water Supply	Drainage	Conservancy
Chakdah Municipality	6.24	7.51	4.58	2.04
Nadia district Average	19.28	12.95	3.74	5.19
West Bengal Average	21.54	6.41	5.24	4.16

Source: Municipal Statistics, Bureau of Applied Economics and Statistics, GOWB

In F.Y. 2011-12, though the expenditure for the municipal services in Chakdah Municipality was close to the district and state average, the General Administration and Collection Charges were considerably lower than the said averages (Table 6).

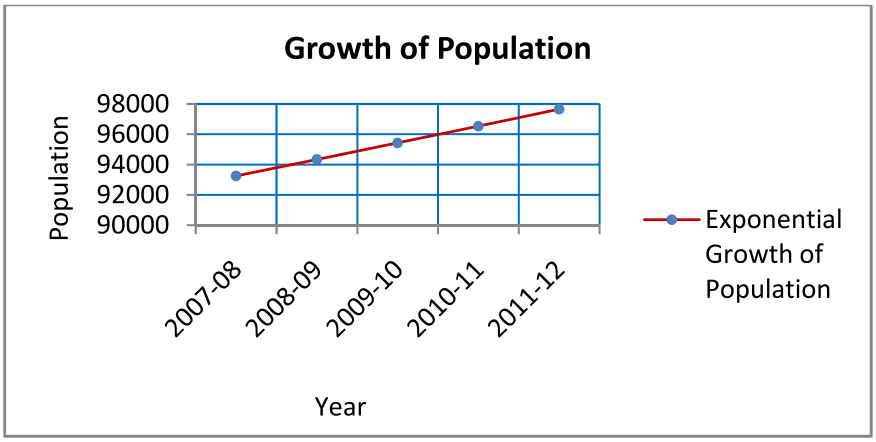

Figure 1: Population Growth ofChakdah Municipality during 2007-08 to 2011-12
Source: Interpolating population of Census 2001 and 2011 assuming exponential growth

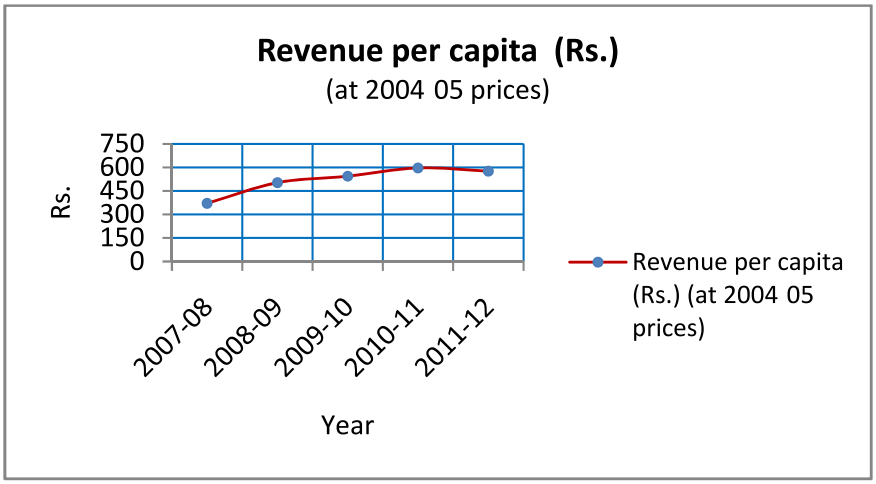

Figure 2: Per Capita Revenue Income(at 2004-05 prices) of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

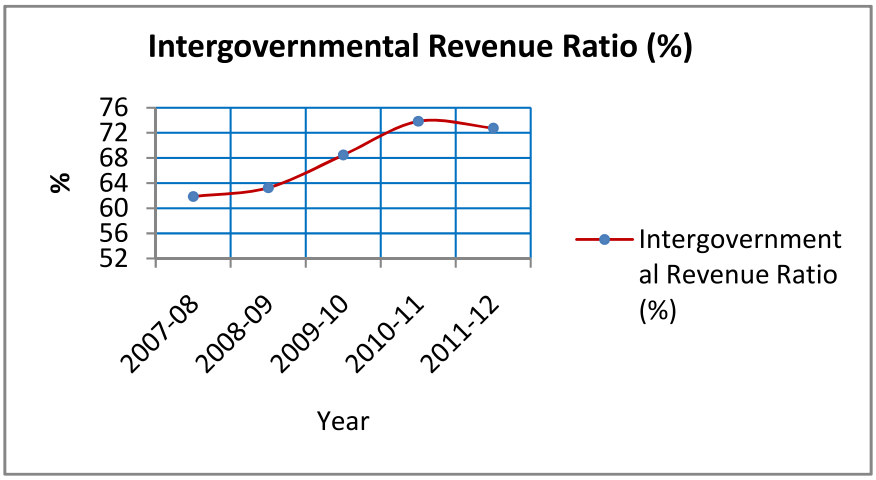

Figure 3: Govt. Grant in Total Revenue of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 20067-08 to 2011-12

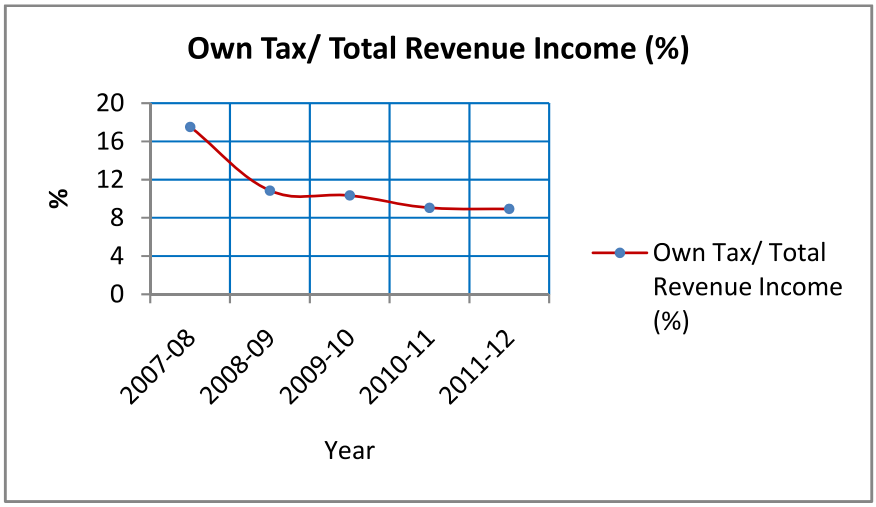

Figure 4: Own Tax in Total Revenue of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

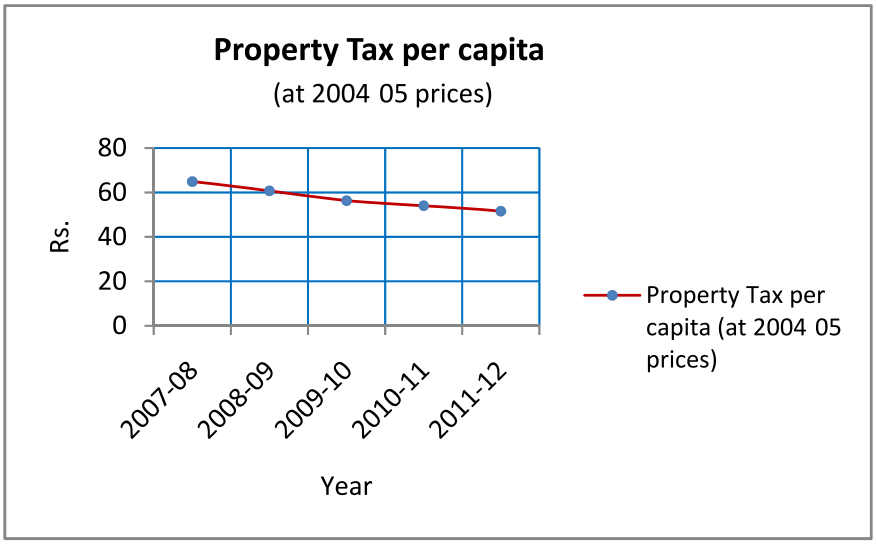

Figure 5: Property Tax (at 2004-05 prices) of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

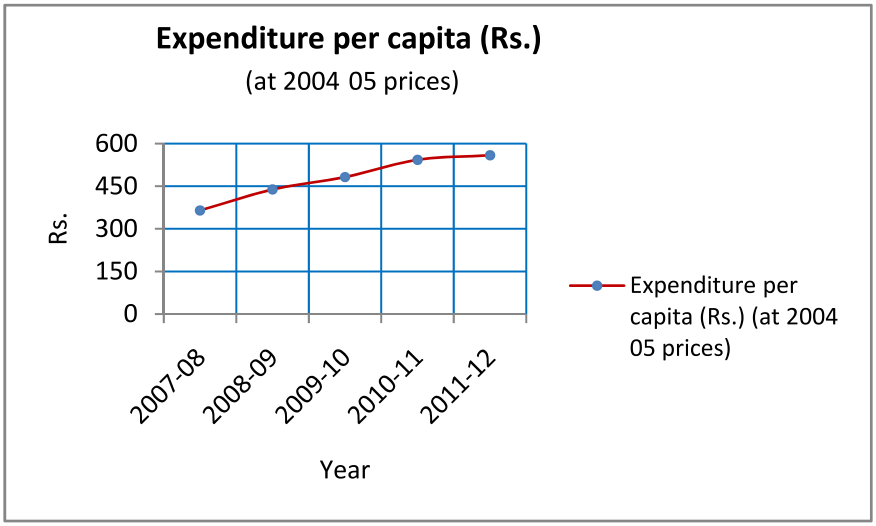

Figure 6: Per Capita Expenditure (at 2004-05 prices) of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

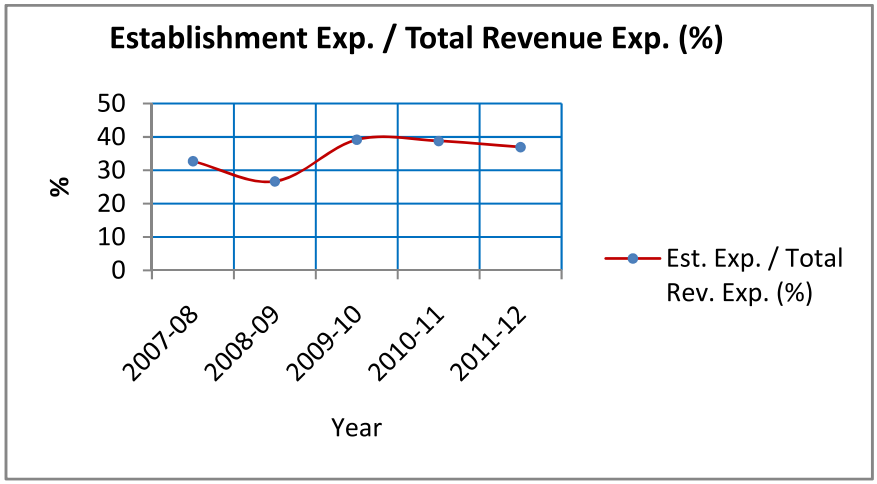

Figure 7: Est. Exp. in Total Rev. Exp. of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

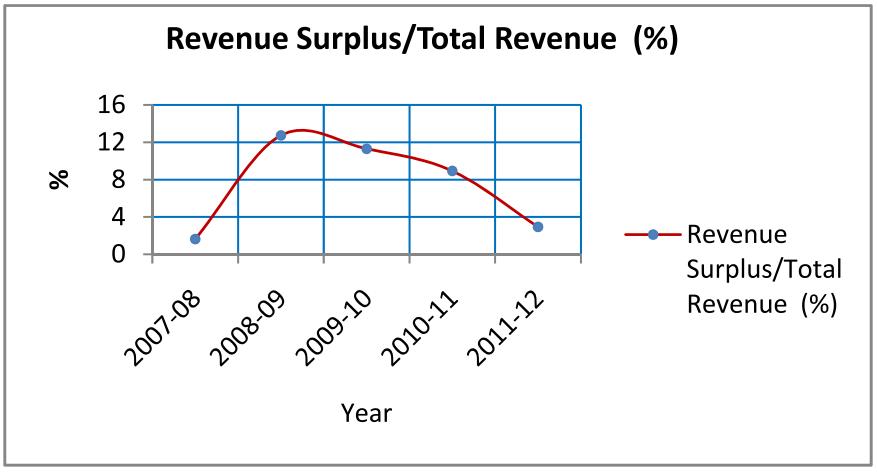

Figure 8: % of Surplus in Total Revenue Income of Chakdah Municipality during 2007-08 to 2011-12
Source: Audited Financial Statements of Chakdah Municipality of 2007-08 to 2011-12

Table 7: Grading Financial Indicators' Values of Chakdah Municipality

Financial Indicators	2007-08	2008-09	2009-10	2010-11	2011-12	Average	Grade
Rev. Surplus/Total Rev. Income (%)	1.62	12.74	11.31	8.92	2.93	7.51	P
Capital Exp./Total Expenditure (%)	76.36	63.61	63.99	55.65	61.72	64.27	F
Cap. Grants+Rev. Surplus/ Cap. Exp.	1.01	1.09	1.12	1.17	1.02	1.08	F
Own Tax/ Revenue Receipts (%)	17.51	10.85	10.35	9.06	8.95	11.34	P
Rev. Grants/ Total Rev. Income (%)	61.87	63.26	68.47	73.85	72.75	68.04	P
Est. Exp/ Rev. Exp. (%)	32.74	26.68	39.19	38.81	36.98	34.88	F
Cost Recovery: Water (%)	78.04	67.92	63.67	50.83	32.86	58.66	G
Collection Efficiency: property tax (%)	N.A.	23.00	39.00	36.00	39.00	34.25	M

Note: F = Favourable, G = Good, M = Moderate and P = Poor

Source: Audited Financial Statements of Chakdah Municipality of 2006-07 to 2011-12 and Municipal Statistics, Bureau of Applied Economics and Statistics, GoWB

Findings:

(a) The population of the municipality is growing at a moderate annual growth rate (AEGR) of 1.163%. Its impact is expected to be in the form of both, increasing income and expenditure for the municipality. The per capita income has increased at a slower rate which has been surpassed by the moderate increase of the per capita expenditure; both the income and expenditure data have been taken at constant price. In any case, the overall situation is that the revenue surplus/ revenue receipts ratio indicator grades the fiscal health of the municipality 'Good'.

(b) The very low value of Own Tax/ Revenue Receipts Ratio indicator as well as the very high value of Revenue Grants/ Revenue Receipts indicator grades the municipality 'Poor' so far as 'dependency' criteria is concerned. In fact percentage of intergovernmental revenue increased from 54.62% in 2004-05 to 73.66% in 2011-12.

(c) The trend of total collection of property tax revenue is slightly downward after a brief initial increase. This appears to be due to the downward slide in the collection efficiency of the current demands of property tax which is not compensated by the weak upsurge in collection of arrears demands. Collection efficiency of total demands of property tax indicator awards 'Moderate' grade to the municipality.

(d) The Salary & Wages /Revenue Expenditures indicator ranks Chakdah municipality as 'Good';

it indicates that this municipality incurs lower proportion on account of salaries and wages in its revenue expenditure. The cost recovery rate of water supply is also 'Good'.

(e) It is good for the future that the municipality is spending a considerable proportion of total expenditure for capital expenditure and in this regard it has been graded 'Favourable'. And the capital expenditure has been 'Favourably' cushioned by Capital Grants+Revenue Surplus.

Bhatpara Municipality

This medium-sized KMA municipality is in North 24 Parganas district. It was established in 1899 on the bank of river Hooghly. Now it comprises 31 wards. There are 3 railway stations viz. Kankinara, Jagatdal and Shyamnagar within this municipality. Earlier, a significant portion of population was engaged in some form in the local jute mills. Economic instability related to jute industry in West Bengal forced many of these mills to shut down. Now, people of Bhatpara are mostly engaged in services in the private and public sector outside the area (in Kolkata and neighborhood) and small personal businesses within the locality.

Table 8: % of Total Expenditure on some principal items: Municipality vis-à-vis district & state averages (Financial Year 2011-12)

Area	Gen. Adm. & Col. Charges	Water	Drainage	Conservancy
Bhatpara Municipality	27.03	1.92	4.34	0.69
North 24 PGS district (average)	23.65	3.18	2.90	2.49
West Bengal (average)	21.54	6.41	5.24	4.16

Source: Same as Table 6

This indicates that the municipality is spending more than the district and state averages for General Administration and Collection Charges expenses but spending less for the municipal services like water supply and conservancy.

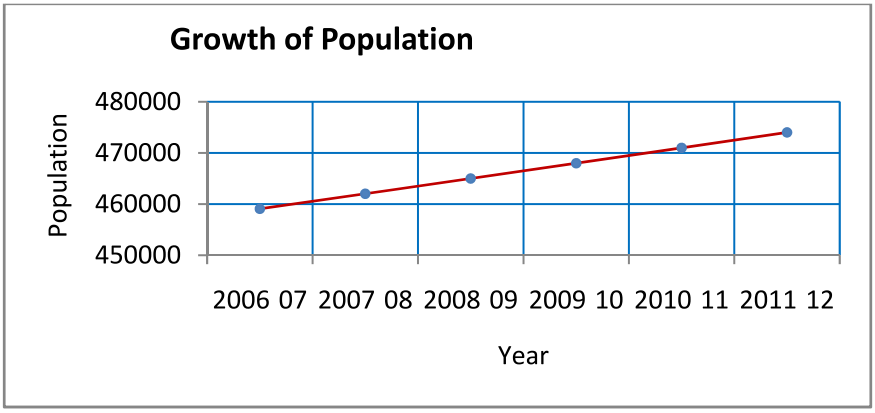

Figure 9: Population Growth of Bhatpara Municipality during 2006-07 to 2011-12
Source: Interpolating population of Census 2001 and 2011 assuming exponential growth

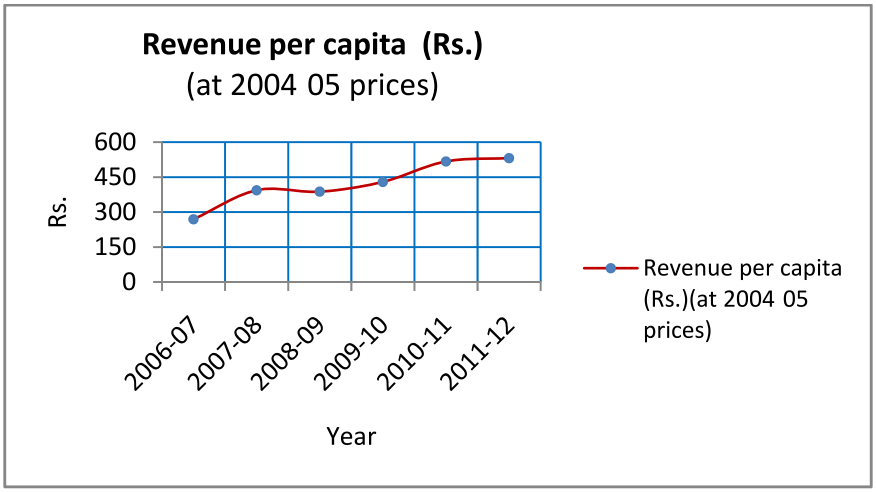

Figure 10: Per capita Revenue (at 2004-05 prices) of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

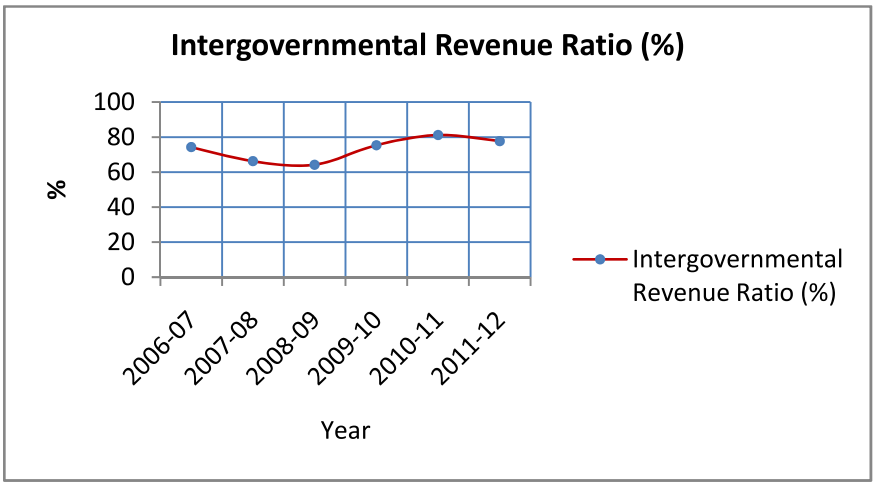

Figure 11: Govt. Grant in Total Revenue Income of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

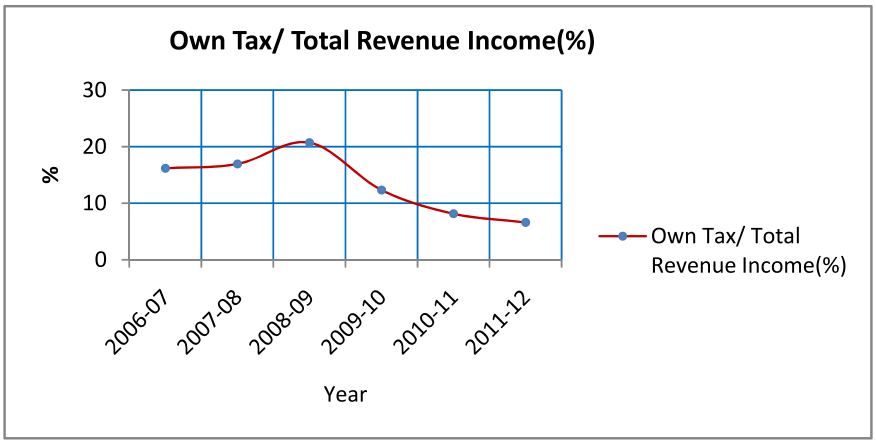

Figure 12: Own Tax in Total Revenue Income of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

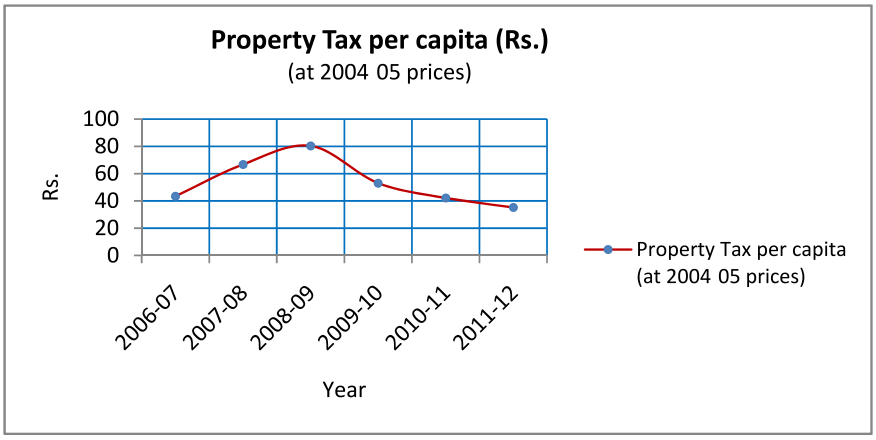

Figure 13: Per Capita Property Tax (at 2004-05 prices) of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

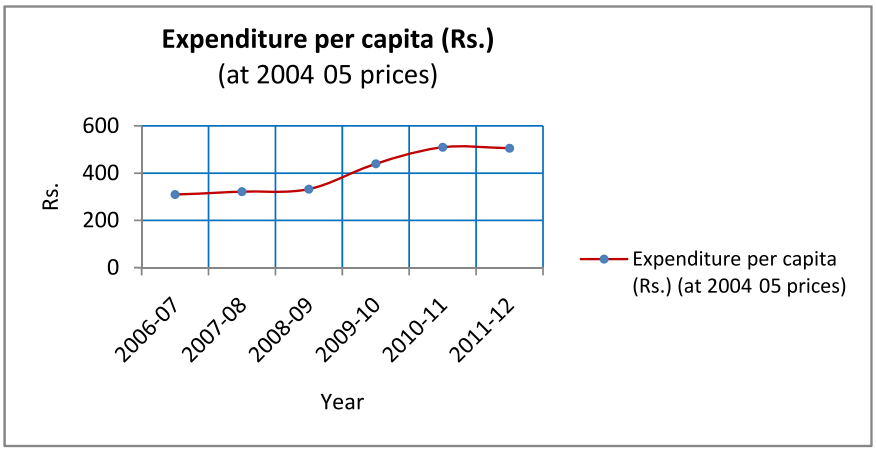

Figure 14: Per Capita Expenditure (at 2004-05 prices) of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

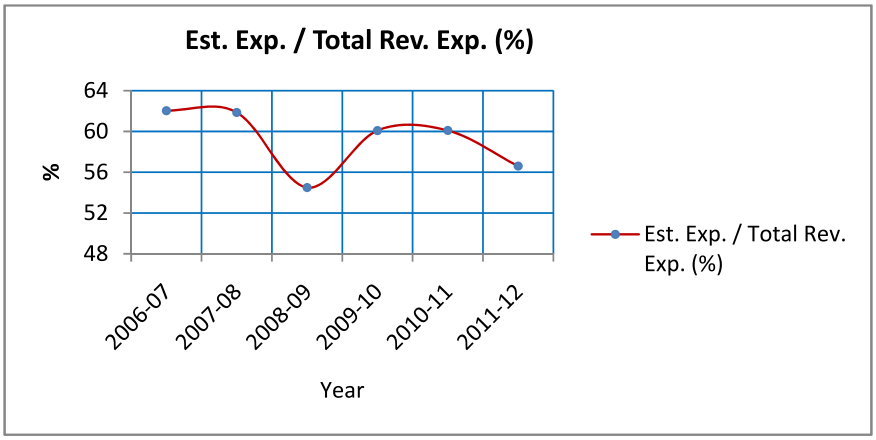

Figure 15: Establishment Expenditure of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

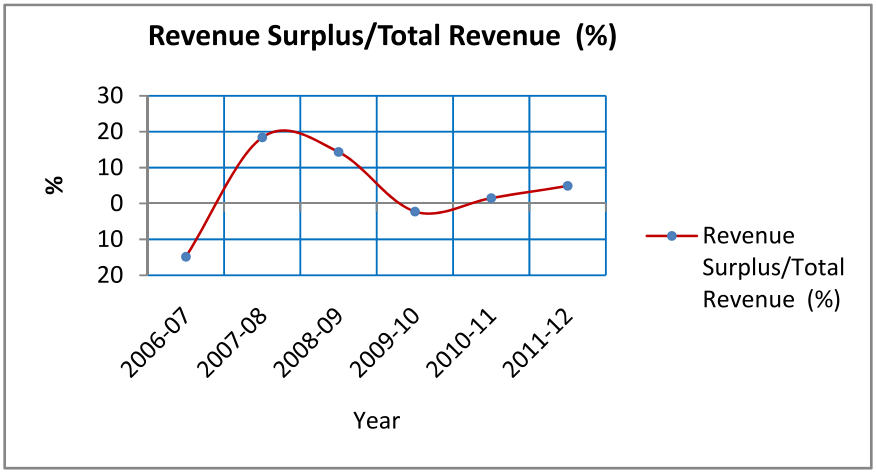

Figure 16: % of Surplus in Total Revenue of Bhatpara Municipality during 2006-07 to 2011-12
Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12

Table 9: Grading Financial Indicators'Values of Bhatpara Municipality

Financial Indicators	2006 07	2007 08	2008 09	2009 10	2010 11	2011 12	Average	Grade
Revenue Surplus/Total Revenue	14.84	18.41	14.35	2.28	1.51	4.92	3.68	P
Cap. Exp./Total Expenditure (%)	38.38	59.74	66.76	59.38	57.44	62.48	57.37	F
Cap. Grants+ Rev. Surplus/ Cap. Exp.	0.85	1.13	1.04	0.95	1.05	1.03	1.01	F
Own Tax/ Total Revenue (%)	16.17	16.93	20.71	12.32	8.13	6.61	13.48	P
Rev. Grants/ Total Revenue (%)	74.29	66.27	64.24	75.37	81.19	79.16	73.18	P
Est. Exp./ Rev. Exp. (%)	62.04	61.87	54.50	60.10	60.10	56.61	59.20	G
Cost Recovery: Water (%)	23.85	N.A	13.41	22.35	2.73	1.10	12.69	P
Collection Efficiency: property tax (%)	N.A	N.A	29.00	13.00	21.00	19.00	20.50	P

Note: F = Favourable, G = Good, M = Moderate and P = Poor.

Source: Audited Financial Statements of Bhatpara Municipality of 2006-07 to 2011-12 and Municipal Statistics, Bureau of Applied Economics and Statistics, GoWB

Interpretation of

(a) The population of the municipality is growing at a modest annual growth rate (AEGR) of 0.641%. The per capita income and the per capita expenditure both have shown similar moderate increasing trend - both the income and expenditure data being taken at constant price. Consequently the revenue surplus/ revenue receipts ratio indicator grades the municipality 'Poor'.

(b) The very low value of Own Tax/ Revenue Receipts Ratio indicator and the very high value of Revenue Grants/Revenue Receipts indicator both indicates that the municipality is in 'Poor' state in 'dependency' criteria. The position of time series line graph showing the percentage of intergovernmental revenue at higher levels and moving further upward - increasing from 61.50% in 2004-05 to 79.16% (the highest point in this time span) in 2011-12 – confirms this observation and also reveals that this dependence of the municipality on government grants is increasing over the years.

(c) The time series line graph showing the property tax revenue is slowly moving downward which is due to the slide of the collection efficiency of the arrears demands of property tax. Collection efficiency of total demands of property tax indicator attaches 'Poor' grade to the municipality.

(d) The Salary & Wages / Revenue Expenditures indicator ranks Bhatpara municipality as 'Moderate' which implies less than 'good' cost efficiency for the municipal services. The cost recovery rate of water supply is also 'Poor'.

(e) The Debt/Capital Expenditures graph shows a moderate upward trend – which means that the capital expenditures are being financed by debt capital at a slow increasing trend. It indicates slowly growing capability of the municipality to reduce dependence on government capital grants for investment in infrastructure. Still, this municipality is found to have 'Favourable' 'Capital Grants+ Revenue Surplus/ Capital Expenditure Ratio'. But the proportion of total capital expenditures is found to be merely 'Good' – in other words, less than 'Favourable'.

Taki Municipality

This non-KMA small municipality is in North 24 Parganas – established in 1869 and presently contains 16 wards. Taki Municipality stands on the bank of the river Ichhamati on the border with Bangladesh. It is the gateway of the Sunderbans, a heritage town and a remarkable tourist place. Mini Sunderbanin Ward No. 1, Jalalpur with Social Forest department for beautification, boating projects in front of Joramondir in Ward No. 3 and eco-tourism parks in Ward No. 5 and 16 – have been planned for development of tourism.

Though the expenditures of this municipality for the municipal services were less than the district and state averages in FY2011-12 it could keep the general administration and collection charges at a very comfortably less level vis-à-vis those averages (Table 10).

Table 10: % of Total Expenditure on some principal items: Municipality vis-à-vis district & state averages (Financial Year 2011-12)

Area	Gen. Adm. & Col. Charges	Water	Drainage	Conservancy
Taki Municipality	6.41	4.34	1.71	3.63
North 24 PGS district (average)	23.65	3.18	2.90	2.49
West Bengal (average)	21.54	6.41	5.24	4.16

Source: Same as in Table 6.

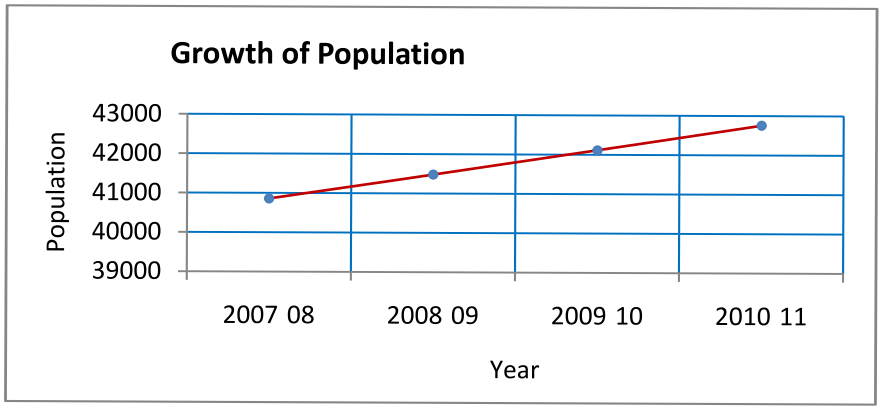

Figure 17: Population Growth (Exponential) of Taki Municipality during 2007-08 to 2010-11
Source: Interpolating population of Census 2001 and 2011 assuming exponential growth

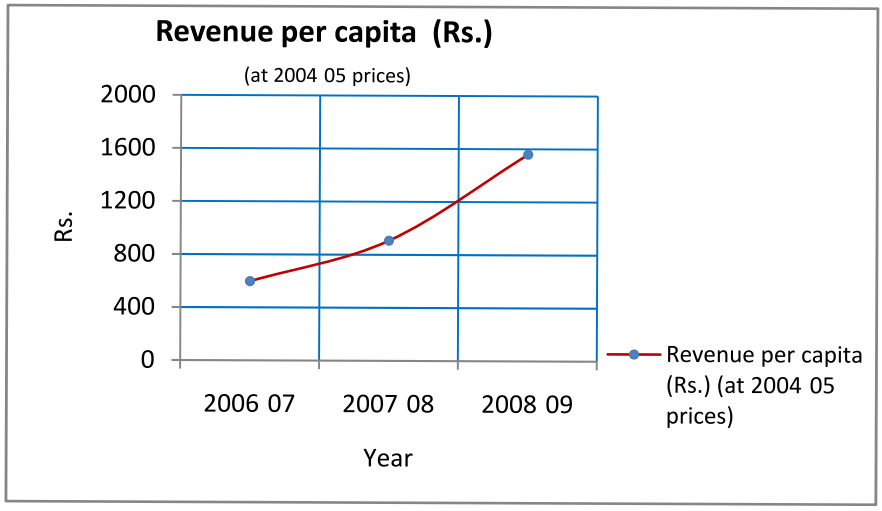

Figure 18: Per Capita Revenue (at 2004-05 prices) of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

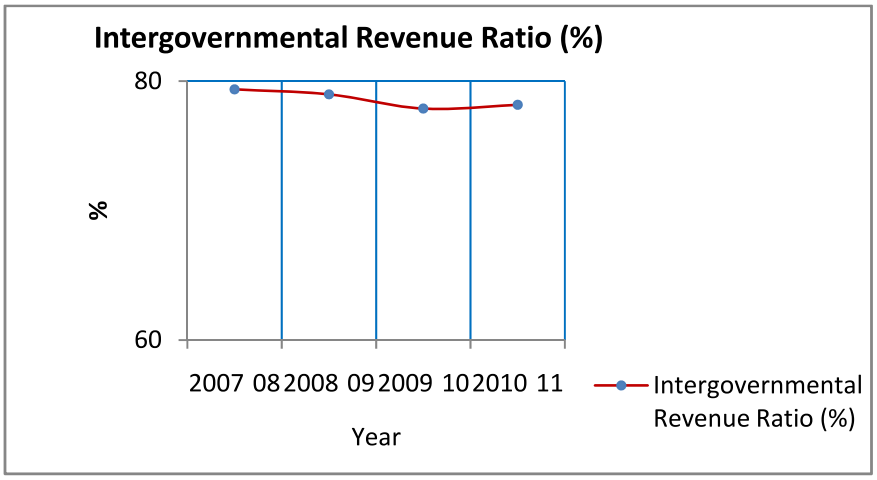

Figure 19: Govt. Grant in Total Revenue Income of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

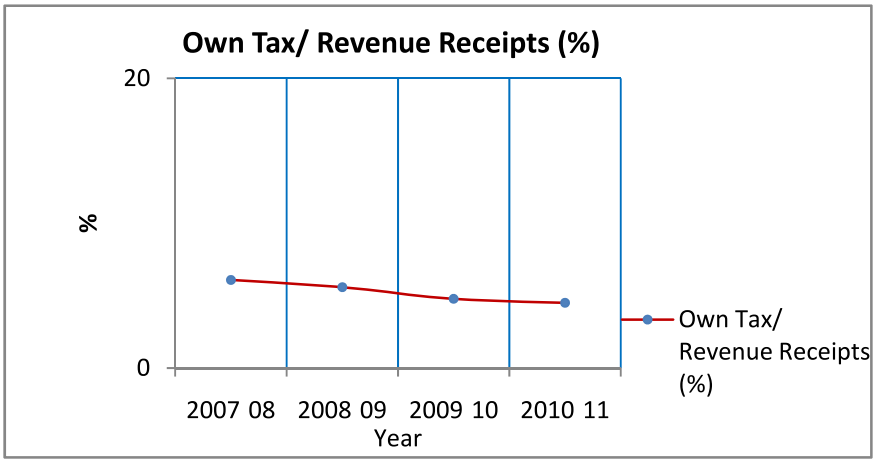

Figure 20: Own Tax in Total Revenue Income of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

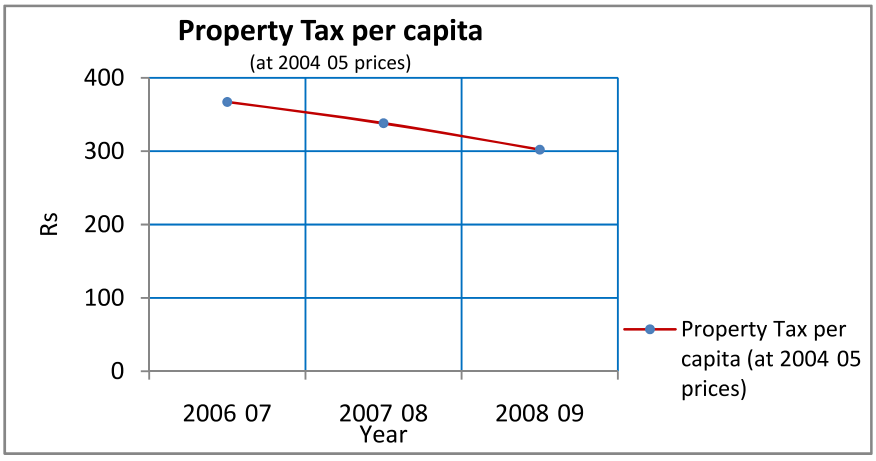

Figure 21: Per Capita Property Tax (at 2004-05 prices)of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

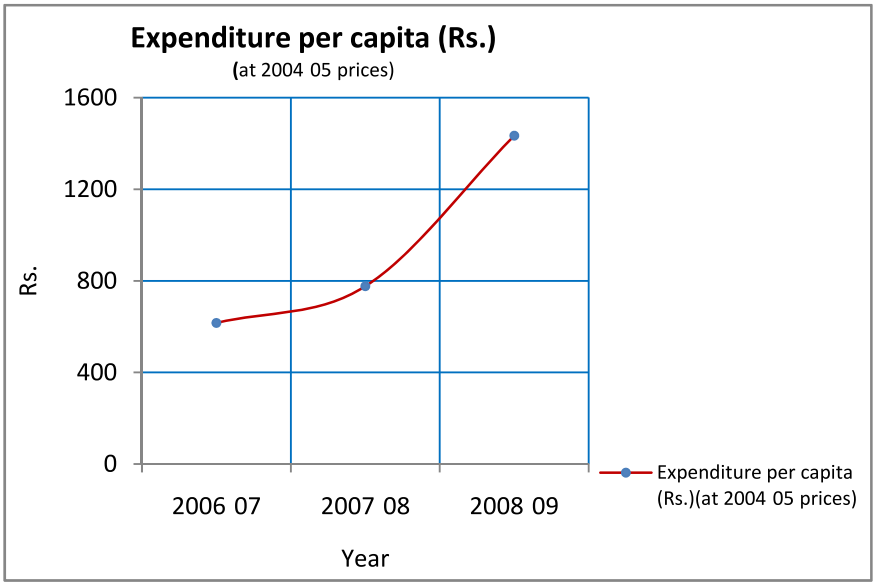

Figure 22: Per Capita Expenditure (at 2004-05 prices) of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

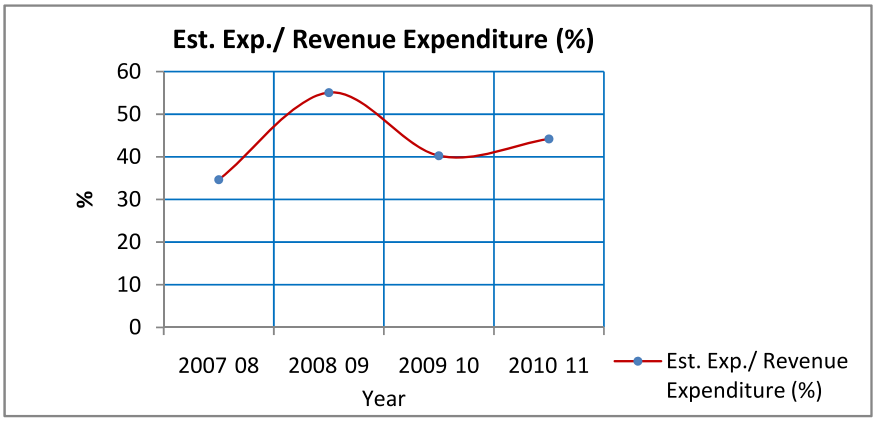

Figure 23: Establishment Exp. in Total Revenue Exp. of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

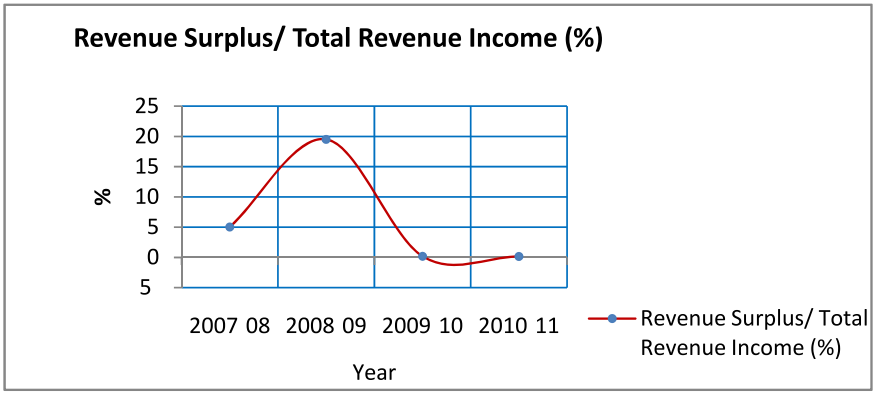

Figure 24: % of Surplus in Total Revenue Income of Taki Municipality during 2007-08 to 2010-11
Source: Audited Financial Statements of Bhatpara Municipality of 2007-08 to 2010-11

Table 11: Grading Financial Indicators' Values of Taki Municipality

Financial Indicators	2007 08	2008 09	2009 10	2010 11	Average	Grade
Rev. Surplus/ Total Revenue (%)	5.03	19.51	0.19	0.16	6.23	P
Cap. Exp./Total Expenditure (%)	54.84	60.87	57.79	61.39	58.72	F
Cap. Grants+Rev. Surplus/ Cap. Exp.	1.17	1.30	1.18	0.49	1.06	F
Own Tax/ Total Revenue (%)	6.08	5.58	4.78	4.51	5.24	P
Rev. Grants/ Total Revenue (%)	79.37	78.98	77.88	78.17	78.60	P
Est. Exp. / Rev. Exp. (%)	34.64	55.09	40.26	44.21	43.55	G
Cost Recovery: Water (%)	N.A.	11.79	6.54	2.16	6.83	P
Collection Efficiency: property tax (%)	N.A.	45.00	42.00	36.00	37.67	M

Note: F = Favourable, G = Good, M = Moderate and P = Poor;

Source: Same as in Table 7

Findings

(a) The population of the municipality is growing at a moderateannual growth rate (AEGR) of 1.528%. The per capita income has shown very weak rate of increase and has been marginally surpassed by higher rate of increase of the per capita expenditure - both the income and expenditure data being taken at constant price. Consequently the revenue surplus/ revenue receipts ratio indicator grades the municipality 'Poor'.

(b) The very low value of Own Tax/ Revenue ReceiptsRatio indicator and the very high value of Revenue Grants/Revenue Receipts indicator both indicates that the municipality is in 'Poor' state on 'dependency' criteria. The position of time series line graph showing the percentage of intergovernmental revenue at higher levels and moving further upward - increasing from 58.09% in 2004-05 to 69.60% (the highest point in this time span) in 2011-12 – confirms this observation and also reveals that this dependence of the municipality on the upper-tier government grants is increasing over the years.

(c) The time series line graph showing the property tax revenue has shown a modest increasing trend which is due to the fact that the collection efficiency of both the arrears demands and the current demands of property tax have shown, though recent, a clear sign of improvement. Collection efficiency of total demand of property tax indicator ranks the municipality as 'Moderate'.

(d) The Salary & Wages / Revenue Expenditures indicator ranks Taki municipality as 'Good' which implies that the municipality has been managing the provision of municipal services in better than 'moderate' manner. But the cost recovery rate of water supply is 'Poor' implying poor state of collection of user charges.

(e) The Debt/Capital Expenditures graph shows a downward trend – which means that the capital expenditures are being financed less by debt capital; in other words, the municipality is being more and more dependent on government capital grants for investments in infrastructure. In corroboration with this observation, this municipality is found to have 'Favourable' 'Capital Grants+ Revenue Surplus/ Capital Expenditure Ratio'. But the redeeming feature is that the proportion of total capital expenditures is found to be 'Favourable'.

Pujali Municipality

This small KMA municipality is in South 24 Parganas district and a very new municipality – established only in 1998 on the bank of river Hooghly-comprising 15 wards now. More than 20% of the households live on fishing, pottery, river transportation and other businesses. A recent trend reveals that about 20% poor households at slums have improved their levels of income engaging in jari works. Economic transformation from agriculture to non- agriculture pursuits has occurred at Pujali in two phases. The first phase earmarked the establishment of burnt clay brick manufacturing units and FCI warehouse on the derelict land of the Orient Jute Mill. The second occurred with the establishment of CESC Thermal Power Generating Station. Pujali witnessed a bewildering amount of investment on huge construction activities. The combined effect has encouraged local youths to opt for various types of construction and trade activities at Pujali, who run about 50% of the brick-manufacturing units at Pujali.

In 2011-12 the municipality is found to have spent much less on water & drainage and the spending for General Administration & Collection Charges is also very low, while for conservancy it is found to be higher than the District and State averages (Table 12).

Table 12: % of Total Expenditure on some principal items: Municipality vis-à-vis district & state averages (Financial Year 2011-12)

Area	Gen. Adm. & Col. Charges	Water	Drainage	Conservancy
Pujali Municipality	2.94	2.04	2.16	4.65
South 24 PGS district (average)	9.87	9.16	12.32	1.65
West Bengal (average)	21.54	6.41	5.24	4.16

Source: Same as in Table 6.

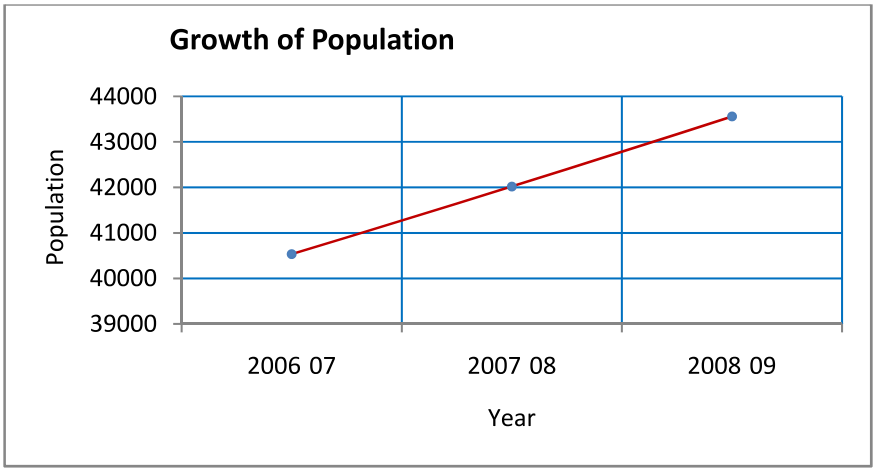

Figure 25: Population Growth (Exponential) of Pujali Municipality during 2006-07 to 2008-09
Source: Interpolating population of Census 2001 and 2011 assuming exponential growth

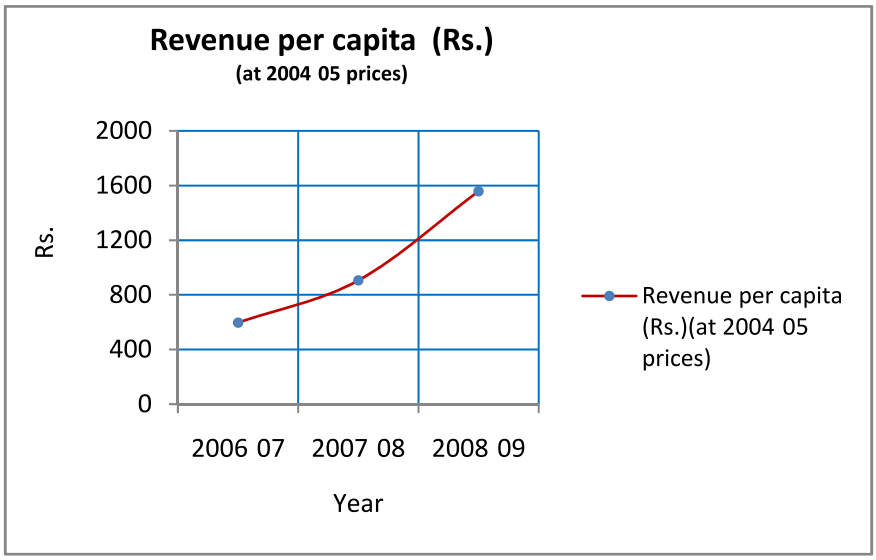

Figure 26: Per Capita Revenue (at 2004-05 prices) of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

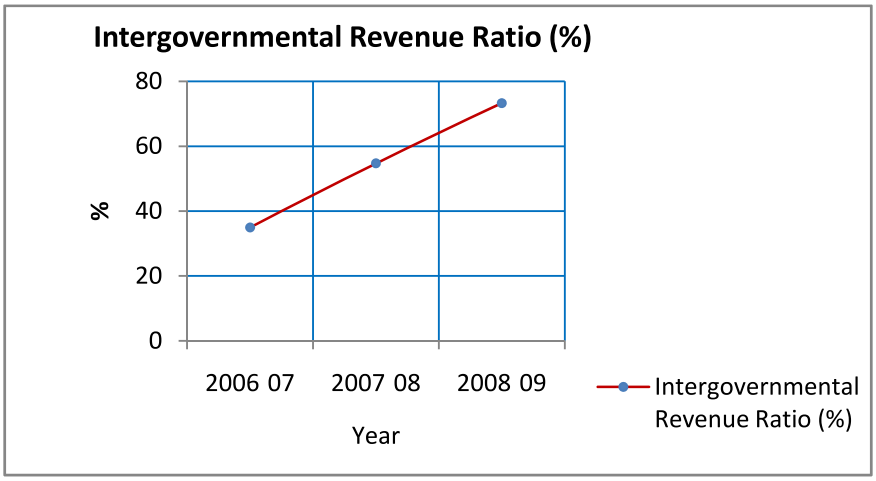

Figure 27: Govt. Grant in Total Revenue Income of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

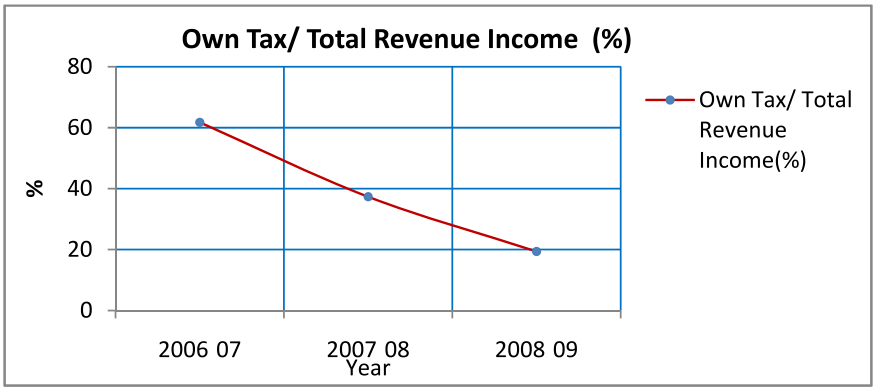

Figure 28: Own Tax in Total Revenue Income of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

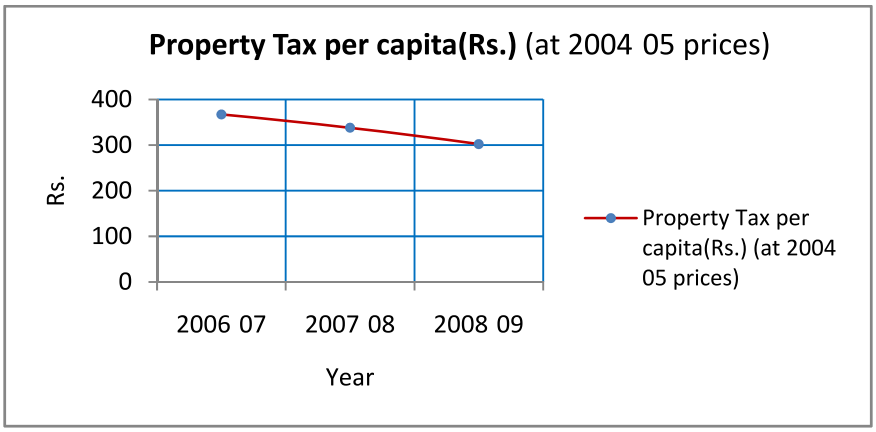

Figure 29: Per Capita Property Tax (at 2004-05 prices) of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

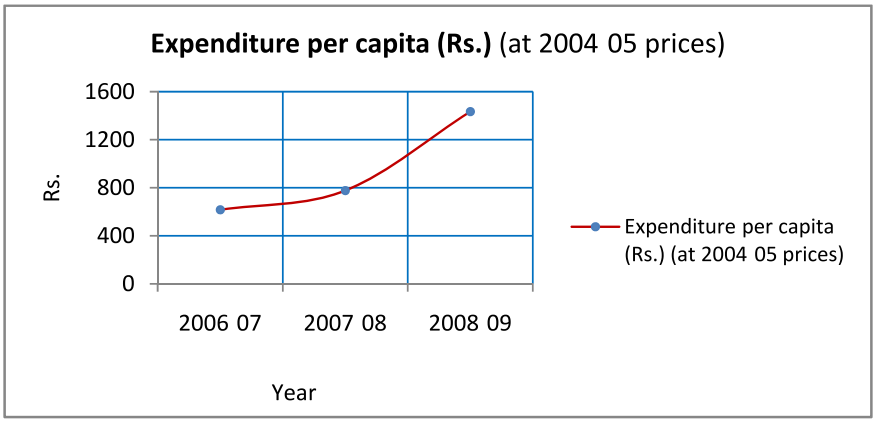

Figure 30: Per Capita Expenditure (at 2004-05 prices) of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

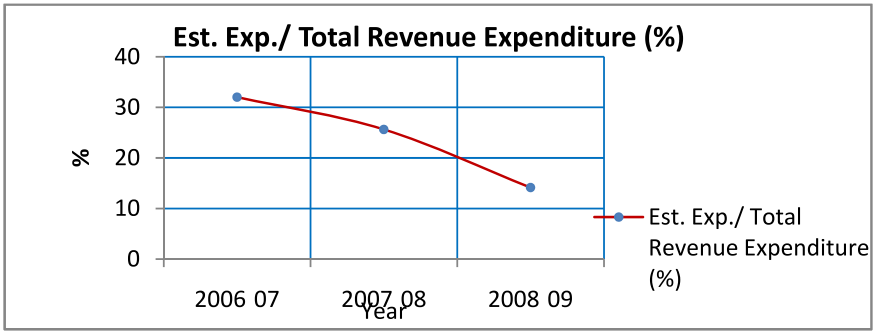

Figure 31: Establishment Expenditure in Total Revenue Expenditure of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

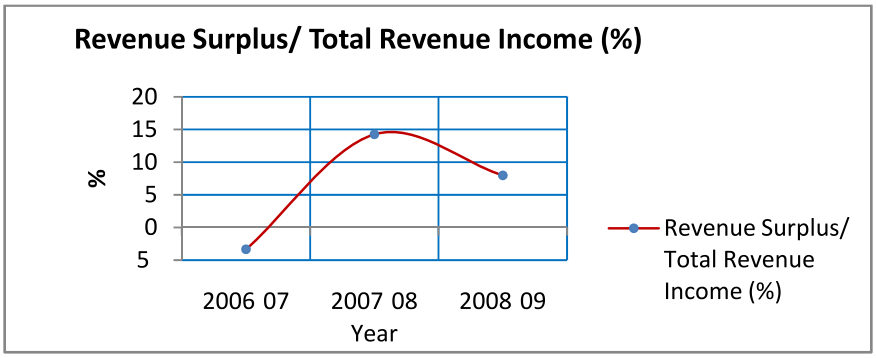

Figure 32: Revenue Surplus in Total Revenue Income of Pujali Municipality during 2006-07 to 2008-09
Source: Audited Financial Statements of Pujali Municipality of 2006-07 to 2008-09

Table 13: Grading Financial Indicator Values of Pujali Municipalities

Financial Indicators	2006 07	2007 08	2008 09	Average	Grade
Rev. Surplus/Total Revenue (%)	3.35	14.26	7.97	6.29	P
Cap. Exp. /Total Expenditure (%)	46.30	N.A.	78.93	62.866	F
Cap. Grants+Rev. Surplus/ Cap. Exp.	0.84	0.86	1.26	1.017	F
Own Tax/ Total Revenue (%)	61.77	37.33	19.38	39.50	M
Rev. Grants/ Total Revenue (%)	34.97	54.72	73.26	54.32	P
Est. Exp. /Rev. Exp. (%)	32.01	25.63	14.15	23.93	F

Cost Recovery: Water (%)	0	0	0	0	P
Cost Recovery: property tax (%)	N.A.	N.A.	93.00	93.00	F
Financial Indicators	2006 07	2007 08	2008 09	Average	Grade
Rev. Surplus/Total Revenue (%)	3.35	14.26	7.97	6.29	P
Cap. Exp. /Total Expenditure (%)	46.30	N.A.	78.93	62.866	F
Cap. Grants+Rev. Surplus/ Cap. Exp.	0.84	0.86	1.26	1.017	F
Own Tax/ Total Revenue (%)	61.77	37.33	19.38	39.50	M
Rev. Grants/ Total Revenue (%)	34.97	54.72	73.26	54.32	P
Est. Exp. /Rev. Exp. (%)	32.01	25.63	14.15	23.93	F
Cost Recovery: Water (%)	0	0	0	0	P
Cost Recovery: property tax (%)	N.A.	N.A.	93.00	93.00	F

Note: F = Favourable, G = Good, M = Moderate and P = Poor; Source: Same as for Table 7.

Findings

(a) The population of Pujali municipality is growing at a high annual exponential growth rate (AEGR) of 3.665%; it is expected to impact considerably on income and expenditure of the municipality. The trend of per capita income, remaining at higher levels- neither improving nor deteriorating , whereas there is a visible though moderate increase in the trend of per capita expenditure - both the income and expenditure data being taken at constant price. The revenue surplus/ revenue receipts ratio indicator grades the municipality 'Moderate'.

(b) Municipality is ranked 'Good' on Own Tax/ Revenue Receipts Ratio indicator and 'Moderate' on Revenue Grants/Revenue Receipts indicator. The cumulative effect of these two rankings is that Pujali municipality scores fairly in 'dependency' criteria. The upward movement of the time series line graph showing the percentage of intergovernmental revenue - increasing from 28.42% in 2004-05 to 53.03% (the highest point in this time span) in 2011-12 – confirms this observation.

(c) The time series line graph shows the property tax revenue is a flat horizontal trend with slight downward tendency at the end of the period –for which the slide of the collection efficiency of the arrears demands is found to be responsible. But the constant high rate of the collection efficiency of the current demands compensates for this; hence collection efficiency of total demands of property tax indicator ranks the municipality 'Favourable'.

(d) The Salary & Wages / Revenue Expenditures indicator ranks Pujali municipality as 'Favourable' which implies that the municipality has been managing the provision of municipal services cost effectively. But the cost recovery rate of water supply is 'Poor' implying poor state of collection user charges.

(e) The Debt/Capital Expenditures graph shows a very modest upward trend – which means that the capital expenditure is not being financed adequately by debt capital; in other words, the municipality is remaining considerably dependent on government capital grants for investments in infrastructure. In corroboration with this observation, this municipality is found to have 'Favourable' 'Capital Grants+ Revenue Surplus/Capital Expenditure Ratio'. However, the proportion of total capital expenditures is found to be 'Favourable'.

5. Evaluation Summary

Table 14: Summary of Comparative Evaluation of Fiscal Health of Four Municipalities

Municipalities	Population Growth	Revenue Earning Rate	Pr. Tax Collect. Efficiency	Water Cost Recovery	% of Rev. Exp. for Salary & Wages	Dependency (Rev. Exp)	Dependency (Cap. Exp)	Cap. Exp. Share in Total Exp.	Prima Facie Assessment
Chakdah (Non-KMA Medium)	Medium	Good	Moderate	Good	Low	High	High	Faourable	Solvent with Govt. Grant; better future for high Cap. Exp.
Bhatpara (KMA Medium)	Low	Poor	Poor	Poor	Moderate	High	High	Good	Insolvent; Higher Govt. Grant for Cap. Exp. may improve condition in future.
Taki (Non-KMA Small)	Medium	Poor	Moderate	Poor	Low	High	High	High	Insolvent; but better future for high Cap. Exp.
Pujali (KMA Small)	High	Moderate	Favourable	Poor	Very Low	Moderate	High	High	Moderately Solvent; better future for high Cap. Exp.

Thus it is found in Table 14 that between KMA municipalities Pujali municipality the small one, is moderately solvent and it also has the prospect of better services in the future as it has incurred higher capital expenditure for infrastructure but Bhatpara municipality, the medium one, is insolvent and only higher Government capital grant for infrastructure can recover the situation in the future – whereas between the Non-KMA municipalities, Chakdah, the medium one, is solvent if periodically supplemented by government revenue grant and like Pujali municipality, it also has the prospect of better services in the future as it has incurred higher capital expenditure on infrastructure.

In spite of all these analyses of the fiscal health of the municipalities, investors would decide whether to invest in municipal infrastructure

considering not only the financial factors, evaluation of which has been discussed so far in this paper, but they would also consider the development of the local economy, the status of finances of the state government, statutory provisions relating to municipal borrowing and opportunity of augmenting revenue base, municipal administrative factors, the extent of updating of reformed accounting system and auditing, and the viability of the concerned projects.

6. Suggestions & Conclusion

In all the case studies, the Cost Recovery for Water Supply by the municipalities is very poor. There is need for considerable improvement of this aspect along with cost recoveries for other services. This should be focused upon with due importance and urgency. Revenue from Property Tax, being the major source of own source revenue, would also have to be increased. The first step should be the administrative efficiency of collection of arrears and current tax demands. For the municipalities covered in these studies, expenditure on salaries and wages cannot be blamed as the major constraint for development or for their solvency to enable attract investment for development.

Lastly, we outline strategies to overcome the stressed fiscal health of the municipalities. Community preferences must be taken into account in choosing courses of action for their financial future. For example, some communities have a strong aversion to debt-financed capital projects. There will erisks involved with any action undertaken. According to Honadle et al. (2004), the following eight strategies comprise a balanced approach to local fiscal health: a. Improving efficiency; b. Expanding tax base; c. Reducing demand for services; d. Shifting costs to non-residents; e. Securing new sources of revenue; f. Increasing spending flexibility; g. Improving management of existing resources; h. Diversifying revenue sources. However, this list is not a prescriptive one applicable for all cases. The right decision would depend on the situation in every specific case.

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Cost-Effective Green Building Strategies for Sustainable Cities & Human Settlements: a step towards fulfilment of Sustainable Development Goals

Shweta Gupta

Introduction

Cities consume more than two-thirds of the world's energy and account for around the same percentage of global carbon dioxide emissions. The total Greenhouse Gas (GHG) emissions from the developing world was projected to exceed those from the developed world by 2015. India is the 5th largest contributor to the total GHG emission although its per capita GHG emission is much lower (113th rank) than other developing countries. The total net GHG emissions from India in 2007 were 1727.71 million tons of CO2 equivalent (MoEF, 2007).

Worldwide, buildings use 32% of the world's resources in construction. They are also responsible for around 40% of global energy use and generate up to 30% of global GHG emissions (IGBC, 2012).In India the residential sector contributes 7.2% of the total GHG emissions1[1] and this is expected to rise as the country is witnessing tremendous growth in real estate sector. Therefore the building sector presents enormous potential for the GHG emissions reduction which up till now has largely remained untapped.

Today the environment conscious concepts hold stronger in the context of complex economic activities of human development. In developing countries, for human development, economic sustain ability is as important as environmental sustain ability. Thus those development activities which bring together economic benefits as well as environmental sustain ability are the key to holistic sustainable development. Green buildings are one of such opportunity that has dual benefit.

Green buildings offer the pathways for making cities and human settlements climate change resilient and sustainable. This holds special significance in the light of Sustainable

1. INCAA, India: Green House Gas Emissions 2007, MoEF, GoI, Year 2010

Development Goals (SDGs)- of making cities and human settlements inclusive, safe, resilient and sustainable (SDG 11) and Climate Action Agenda (SDG 13). The current SDGs have major thrust on reducing the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management by 2030. And by 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change (United Nations, SDGs 2016-2030).

Against this backdrop this paper sheds light on the green building strategies that are cost effective and has potential for replication in the segment of affordable mass housing and slums redevelopment in the country and in similar contexts across the world.

Environmental Impacts of Buildings

As per the World Watch Institute the buildings form one of the major catalysts for environmental degradation on the planet as the buildings consume two fifths of world energy production, one sixth of all water pumped out of natural flows and one quarter of all virgin wood that is harvested[2]. Global projections of primary energy use for the buildings sector show a doubling, from 103EJ to 208EJ, between 1990 and 2020 in a baseline scenario (WEC, 1995a).

A building consumes:

- 2/5 of world energy production
- 1/6 of all water pumped out of natural flows
- 1/4 of all virgin wood harvested (not including furniture)

Source: World Watch Institute Paper 124, March 1995

As per 'United Nations Sustainable Buildings & Construction Initiative' buildings are responsible for up to 40% of total global greenhouse gas emissions considering a building's lifespan, including construction, operation, maintenance, fit-outs and demolition.

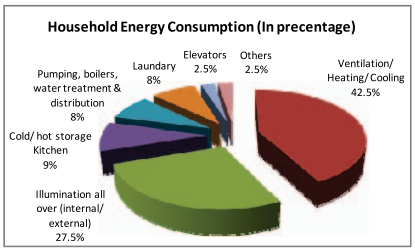
India too is witnessing tremendous growth in infrastructure and construction development. The construction industry in India is one of the largest economic activities and is growing at an average rate of 9.5% as compared to the global average of 5%. The manufacturing and construction contributes to 15% of GHG Emission and 24% of CO2 Emission in the country. The cement industry contributes annually 32% of GHG Emission by Industry Sector.[4] Commercial and residential sectors continue to be a major market for the construction industry in India (India Green Building Council, 2012). Commercial and institutional sector uses oil & natural gas over and above

2. Roodman, David M' Lenssen, Nicholas,1995, "A building revolution: How ecology and health concerns are transforming construction", Worldwatch Institute Paper 124, March 1995
3. MoEF NATCOM Project for UNFCC 2004
4. INCAA, India: Green House Gas Emissions 2007, MoEF, GoI, Year 2010

the conventional electricity for its power needs.

The residential sector in India is one of the largest consumers of fuel outside the energy industries. Biomass constitutes the largest portion of the total fuel mix use in this sector.

The total household consumption of energy in India accounts for 40-50 per cent of the total energy consumption in the country. Of the household consumption, about 27.5 per cent on an average is utilised for illumination and 42.5 per cent for ventilation/cooling /heating in residential buildings, which varies according to conditions such as seasons, latitude, etc.[5]



The total CO2 eq emission from residential & commercial/institution sector was 139.51 million tons of CO2 eq in 2007. The residential sector contributes 7.2% of the total GHG emissions in India.

Given the rapid development especially in the developing world, building& construction sector is going to be key source both in the creation and operation phase of the building. Taking this into consideration and the fact that efficiencies can be gained in this sector, the United Nations Environment Programme (UNEP) has stated that "no other sector has such a high potential for drastic emission reductions", and the Intergovernmental Panel on Climate Change (IPCC) has identified that buildings offer some of the most cost effective and expedient ways to reduce GHG emissions.

Greenhouse Gas Mitigation Opportunity in Real Estate Sector

Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report shows that global built environment industry provides more cost-effective greenhouse gas mitigation opportunities than any other industry or sector.

- Commercial buildings sector, projected to grow at an average rate of 2.6% per year in India.
- Demand for energy to run appliances such as TVs, air conditioning and heating units, refrigerators and mobile phone chargers will increase substantially as living standards rise in India.
- Total specific energy consumption for conditioned buildings ranges from 80 kWh/m2/annum for domestic

5.The Bulletin on Energy Efficiency April 2001, Vol. I, Issue 5, V. Suresh, Chairman & Managing Director, Housing & Urban Development Corporation Ltd. HUDCO Bhawan, India Habitat Centre, Lodhi Road, New Delhi

buildings to about 150 kWh/m2/annum for commercial buildings[6]. According to Indian Green Building Council (IGBC) report, buildings in India annually consume more than 20% of electricity. Around 60% of total energy used for a typical commercial building is in its Heating, Ventilation & Air Conditioning (HVAC) system and 20% in lighting system. This can be reduced by 30% and 40% for domestic and commercial buildings respectively through energy conscious design without compromising on level of comfort[7].

Conservation of energy in buildings through appropriate design, construction, operation and maintenance practices assumes prime importance. The pre-construction phase is the optimal time to implement Energy Efficient design with minimal costs. Some results indicate that savings realized during the first twenty years of operation can account for more than 15% of construction costs[8].

The building sector has enormous untapped potential for emissions reduction, thus it presents the least cost abatement opportunity. It is important to support energy efficiency and emission reduction programmes in the building sector by recognizing them as a Nationally Appropriate Mitigation Action (NAMA) and reforming the Clean Development Mechanism (CDM) to improve energy efficiency and reduce correlating GHG emissions at the lowest average CO2 abatement cost relative to other sectors. Green buildings achieve this and also do more than deliver a smaller carbon footprint.

Green Buildings Movement in India

Suggestions of the 'Expert Group on Low Carbon Strategies for Inclusive Growth', of Government of India

- Need to invest in renewable technologies, particularly solar, wind and second generation bio-fuels on the supply side.
- On the demand side, we need to accelerate adoption of super-efficient electrical appliances through a combination of market and regulatory mechanisms.
- Buildings: While efficient appliances can reduce demand for power to some extent, change in the design and structure of building itself can act as a multiplier in reducing overall energy demand.
- Need to both evolve and institutionalize Green Building Codes at all levels of Government: Centre, State and Urban Local Bodies.

Source: Approach to 12th Five Year Plan, Climate Change and Environment

6 Energy Fact Sheet, India, 2007/2008; (Royal Institution of Chartered Surveyors UK, 2007, P-9
7 Climate Change, Green Buildings and India, the document can be accessed on: http://agneyablog.wordpress.com/2011/01/25/climate-change-green-buildings-and-india-2/ http://www.inis-enterprises.com/gbc2010/Day2/Ms_Mayurika_Chakraborty_Presn.pdf
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The Government of India has recognised the importance of promoting sustainable habitat development which is reflected in its 'National Action Plan for Climate Change' (NAPCC), 2008. One of the eight missions in NAPCC is 'National Mission on Sustainable Habitat' which aims to promote introduction of energy efficient buildings, sustainable waste management in cities and sustainable transport. Government of India has also set up an Expert Group on Low Carbon Strategies for Inclusive Growth.

Green Buildings can deliver rapid and cost-effective reductions to emissions and energy consumption – with a significant percentage realising positive returns to the global economy[9]. Green concepts and techniques in the residential sector can help address environmental issues like handling of consumer waste, water efficiency, energy efficiency, reduction in fossil fuel use in commuting and conserving natural resources. Most importantly, these concepts can enhance occupant health, happiness and well being. More than ever there is an imminent need to introduce green concepts and techniques in this sector, which can aid growth in a sustainable manner.

With a modest beginning of 20,000 sq.ft of Green Building footprint in the country in the year 2003, up till June 2012 a total of 1667Green Building projects across the five climatic zones of the country covering over 1.18 billion sq.ft. were registered with Indian Green Building Council (IGBC), of which 253Green Buildings were certified and are fully functional[10].

In 2009, there was close to 200 million m2 of built office space. This number is expected to grow even further by over 70% by the year 2030 (890 million m2). If the Energy Conservation Building Code (ECBC) were to be fully implemented, the overall energy consumption from new commercial buildings could be reduced by 25-40%. Even in the existing commercial buildings, retrofitting to standards can reduce the energy consumption figure by around 25%.

Demystifying Green Buildings and Eco-Housing

Buildings have a significant impact on resource use and the environment during their life cycle. Conventional buildings are highly resource intensive, both during construction as well as to operate and maintain. On the other hand, buildings based on 'Green concept and Eco-housing principle' are designed, built and operated in an ecological and resource efficient manner. 'Green Buildings and Eco-housing' signifies

9. Energy Efficiency and GHG Emission Reduction, Initiative by Indian Cement Industry, Dr. S.P. Gosh, Technical Advisor, Cement manufacturer's Association, India-Japan Energy Forum, 2008, TERI
10. Information referred from Indian Green building Council website, http://www.igbc.in/site/igbc/index.jsp, Accessed on 19th June 2012)

environmentally benign and energy efficient buildings, sustainable construction practices and a healthy and productive indoor environment with lowered use of energy and natural resources.

Green Buildings and Eco-Housing Defined

Green building and Eco-Housing concept is based on accepted energy and environmental principles and strikes a balance between environmental and economic concerns. It brings synergy in the traditional/ vernacular known established practices and new emerging modern technology concepts.

"A Green Building is one which uses less water, optimises energy efficiency, conserves natural resources, generates less waste and provides healthier spaces for occupants, as compared to a conventional building."

A Green Building depletes as little of the natural resources during its construction and operation. The aim of a Green Building design is to:

- Minimize/ Reduce the demand on non-renewable resources
- Maximize the utilization efficiency of resources when in use (efficiently using energy, water and other natural resources.)
- Maximize reuse and recycling of available resources (Eg. Use of recycled and environmental friendly building materials)
- Utilization of renewable resources.
- Minimal Disturbance to natural topography, landscape and site condition.

The impact of Green Buildings and Eco-housingisthreefold:

- Environmental – by reducing environmental degradation, solid waste and pollution, improving air and water quality and conserving natural resources by reducing the rate of their consumption
- Economic – by reducing operating costs, enhancing value of the asset and optimizing the life-cycle performance of the building
- Health – by improving air, thermal and acoustic environment, enhancing occupant health and contribution to overall quality of life.

Green Buildings are resource efficient. It maximizes the use of efficient building materials and construction practices; optimizes the use of on-site sources and sinks by bio-climatic architectural practices; uses minimum energy to power itself; uses efficient equipment to meet its lighting, air-conditioning, and other

needs; maximizes the use of renewable sources of energy; uses efficient waste and water management practices; and provides comfortable and hygienic indoor working conditions.

In summation, the following aspects of the building design are looked into in an integrated way in a Green Building:

- Site planning
- Building envelope design
- Energy Efficiency: Building system design HVAC (heating ventilation and air conditioning), lighting, electrical, and water heating
- Integration of renewable energy sources to generate energy onsite.
- Water, solid waste and waste water management
- Selection of ecologically sustainable building materials (with high recycled content, rapidly renewable resources with low emission potential, etc.).
- Indoor environmental quality (maintains indoor thermal and visual comfort and air quality)

Green Building and Eco-housing design is evolved through a process that requires all concerned –the architect, civil engineer, landscape designer and the air conditioning, electrical, plumbing, and energy consultants – to work as a team to address all aspects of building and system planning, design, construction, and operation. They critically evaluate the impacts of each design decision on the environment and arrive at viable design solutions to minimize the negative impacts and enhance the positive impacts on the environment.

Tenets of Green Buildings and Eco-housing

- **Water Efficiency and Wastewater Management:** Most of the Asian countries are water stressed and in countries like India the water table has reduced drastically over the last decade. Green Buildings encourages use of water in a self - sustainable manner through reducing, recycling and reusing strategies.
- **Handling of Household Waste:** Handling of waste in residential buildings is extremely difficult as most of the waste generated is not segregated at source and has a high probability of going to landfills. This continues to be a challenge to the municipalities which needs to be addressed. The Green Building's design intends to address this by providing and establishing the mechanism to

segregate and treat organic waste.

- **Energy Efficiency:** The residential sector is a large consumer of electrical energy. Green Buildings can reduce energy consumption through energy efficient lighting, air conditioning systems, motors, pumps, etc. In Green Building design selection and use of Bureau of Energy Efficiency (BEE)labelled equipment and appliances is encouraged.

- **Reduced Use of Fossil Fuels:** Fossil fuel is a slowly depleting resource, world over. The use of fossil fuel for transportation has been a major source of pollution. The Green Building design encourages the use of alternate fuels for transportation and captive power generation.

- **Reduced Dependency on Virgin Materials:** The Green Building design promotes use of recycled & reused material and discourages the use of virgin wood thereby addressing environmental impacts associated with extraction and processing of virgin materials. Reduced usage of virgin wood is also encouraged.

- **Health and Well-being of Occupants:** Health and well-being of occupants is the most important aspect of Green Buildings. Designing Green Buildings ensures minimum performance of day lighting and ventilation aspects which are critical in a building envelop and fenestration design. The Green Building design recognises measures to minimize the indoor air pollutants.

Key Parameters for Green Buildings and Eco Housing

The key aspects of Green Buildings and Eco-Housing are studied based on the existing national and international Green Rating Systems, Policies and Guidelines for Eco-housing and Green Building namely LEED India(Leadership in Energy and Environmental Design), 2007; GRIHA (Green Rating for Integrated Habitat Assessment) – TERI; Eco-Housing Assessment Criteria Version 1 and 2, 2009 – IIEC; IGBC Green Homes Rating System Version 1, 2009 - Indian Green Building council, CII (Confederation of Indian Industry).

In India both GRIHA the National Green Building Rating System led by TERI and the CII led IGBC – LEED Certification are most prevalent. These are acting as benchmark to measure sustainable design practices and to award and certify the buildings as green. LEED India also provides building owners,

architects, consultants, developers and project managers, the tool they need to design, construct and operate Green Buildings.

As arrived from the secondary research and the author's own experience in the sectors of water supply, sanitation, solid waste management, housing for poor and slum redevelopment- the Green Buildings and Eco-housing parameters are put forth for this research paper. The Green Building parameters are divided into 10 broad categories with each individual category describing a set of measures that need to be fulfilled.

A. Water Conservation
B. Water Efficiency
C. Onsite Sanitation and Septage Management
D. Onsite Wastewater Management
E. Onsite Solid Waste Management
F. Energy Efficiency
G. Onsite Renewable Energy Utilization
H. Sustainable Eco-friendly Building Materials
I. Site Selection & Planning
J. Indoor Environment Quality

The framework elucidated in the following table is designed to serve as a guide on 'Imbibing Green features into Affordable Mass Housing Segment'. The table features only select measures for each of the Green Building criteria that have a significant and direct relevance to the affordable mass housing programmes undertaken by the Government of India. The attempt is made for delineating mandatory and voluntary measures.

Key Parameters for Green Buildings and Eco-Housing					
Parameters		Indicators	Measures	Mandatory (M) / Voluntary (V)	Remarks
1	Water Conservation	• **Rain Water Harvesting** to capture at least 50% of the runoff volume	Roof Top Rain Water Harvesting	M	• Harvest/ store/ recharge & make provisions for utilisation of 100% rainwater from roof and 60% of site runoff
			Ground Water Recharge	M	
		• **Reuse of Rain Water**	• Limit or eliminate the use of potable water for landscape irrigation. • Reuse of rain water for gardening, washing and other building applications.	M	
		• **Water Efficient Fixtures***(taps/ faucets/ WC)*	• Flow fixtures (faucets, taps, shower etc) - 12 LPM. • Flush Fixtures to maintain low flow rates not exceeding 8 LPM	V	

Key Parameters for Green Buildings and Eco-Housing					
Parameters		Indicators	Measures	Mandatory (M) / Voluntary (V)	Remarks
2	Water Efficiency	• **Universal Access of Municipal Water to all including slum dwellers**	• Subsidised Group water connections/ Individual water connections in slums (Applicable in In-situ Slum Up-gradation Model)	M	To stop • Illegal water connections, • Water wastage at Public Stand Posts, • Extensive ground water extension.
		• **Efficient Water Management Practices**	To optimise water consumption • Maintain uniform water supply pressure restricted to 25-30 m head by use of separate distribution down takes for each floor. • Use of pressure reducing valves.	V	At Urban Local Body Level • Bulk water metering to reduce Non Revenue Water • Identify and Regularise Illegal Water Connections • Conduct Water Audits- indicating leakages and pilferages of transmission & distribution network,
			• Water metering at consumer end and water meters at water pumps • Level controllers in overhead water tanks	M	
3	Sanitation	**Universal Access of Sanitation to all including slum dwellers**	Shared toilets/ Individual Toilets in slums- Prefabricated (concrete) toilet blocks/	M	• At ULB level grant/ subsidy for construction of individual toilets by households undergovt scheme.
		Sanitation &Septage Management Practices	Composting Toilets, Toilets with Bio-Digestorsetc	V	
4	Onsite Wastewater Management	• **Wastewater Treatment***(at least 50% wastewater/ grey water treated on site)*	• Install a treatment system based on non energy intensive and eco-friendly technology. E.g. Root Zone Treatment (RZT)	M	
			• Install & Use dual plumbing lines for separation of total volume of grey and black water. • Install a separate plumbing line for use of treated water for flushing.	V	
		• **Reuse of treated wastewater**	On site recycled water to be used for • landscaping -watering lawns, garden and/ or other building applications	M	
			• Car washing and/ or toilet flushing	V	

Key Parameters for Green Buildings and Eco-Housing					
Parameters		Indicators	Measures	Mandatory (M) / Voluntary (V)	Remarks
5	Onsite Solid Waste Management	• **Segregation of waste at source**	• Segregation of waste at household level. • Collection of segregated waste at community level • Allocate separate space for the collected waste before transferring it to the recycling/disposal stations to prevent the mixing up of segregated waste before processing or disposal.	M	
			• Use different colored bins for collecting different categories of waste from the building to promote the segregation of waste for efficient resource recovery. • Provision of separate bins/ chutes for every building (In High rise for collection and separation of bio-degradable, non biodegradable and recyclable wastes.)	V	
		• **Treatment of organic waste**	• Install treatment facility - anaerobic digestion e.g. biogas plant , bio-methanation plant or vermi-composting or in-vessel composting for treatment of organic wastes	M	
		• **Reuse of Recyclable waste**	• Recover energy/ manure/ biogas from treatment plant and use/ application within the site. • Make arrangements for recycling of waste through local dealers to maximize the recovery of resources from the recyclable.	M	
6	Energy Efficiency	• **Energy Efficient Lighting/ electrical fixtures/ fittings/ appliances** *(Efficient Luminaries & Lighting Power density)*	• CFL lamps (compact fluorescent lamps) operating on low loss ballast. • Fluorescent Tube lights and T5 tube lights for lighting • LEDs for general lighting of common/ circulation areas - passages, staircase, lifts, corridors, lobbies. • Minimum average luminaire efficacy to be 65 lm/ watt. • Provide fixed/ pre-wired luminaries to have its sockets that will only accept CFLs/ LEDs. • Energy efficient ceiling fans with power factor of 0.9. • Energy efficient lifts with group control. • Minimum 60% efficiency for pumps of capacity greater than 3 HP and ISI rated water pumps for others.	M	

Key Parameters for Green Buildings and Eco-Housing					
Parameters		Indicators	Measures	Mandatory (M) / Voluntary (V)	Remarks
		• **Efficiency of electrical systems**	• All electrical systems to meet minimum efficiency criteria as specified by Energy Conservation Building Code (ECBC) 2007. (Use of high efficiency pumps, motors, transformers, lifts etc). • Compliance with ECBC Code 2007 of the Bureau of Energy Efficiency (BEE), GoI. • Power factor > 0.9. • Promote use of energy star rated appliances.	V	
7	**Onsite Renewable Energy Utilisation**	• **Solar Photo Voltaic and/or Wind Mills** • **Wind – Solar Hybrid System**	Solar / Wind Energy utilization for • 50%-100% External and common area lighting systems, lift backup. • Electric consumption	V	Install renewable energy systems for at least 2.5% of annual energy consumption building.
			• Solar powered LED lamps in all display/ exit sign boards	V	
		• **Solar water heating system**	• For water heating	V	
		• **Biomass**	• Waste to energy options e.g. Bio-methanation	V	
8	**Sustainable Eco-friendly**	• **Local/ Vernacular Material**	• Ensure at least 50% of the total building materials by cost used in the building should have been manufactured within a radius of 500 Km.	M	
		• **Materials with recycled content**	• Using 25% Pozzolona material blended Portland cement • Fly ash bricks/ lime bricks/ bricks made of pulverised debris, cement bricks, industrial waste based bricks • Use of 25-50% sand & aggregate from pulverised debris/ sintered fly ash for concrete & mortar. • Pozzolona material blended Portland cement mortar. • Plaster - calcium silicate plaster, cement plaster, fiber reinforced clay plaster.	M	
		• **Reuse of salvaged materials**	• Recycled steel forms & bars for reinforcement upto 75%	V	
		• **Alternative building material technologies**	• Ferro cement/ precast components for columns, beams, slabs, staircases, lofts, balconies, roofs, lintels etc. • Ready mix concrete • Use resinous curing agents. • Ferro cement / precast RCC frames/ frameless doors.	V	

Key Parameters for Green Buildings and Eco-Housing					
Parameters		Indicators	Measures	Mandatory (M) / Voluntary (V)	Remarks
		• **Waste reduction during construction**	• Debris recycling and reuse in redevelopment. • Prepare plan for Minimum 30% debris being recycled and its onsite application during construction.	M	
		• **Water supply, sanitary & plumbing system**	• Use RCC, un-plasticised PVC (ISI 15328), GI/ CI pipes instead of lead, AC pipes. • Use products with recycled aluminum and brass components for fittings, fixtures and accessories.	M	
		• **Minimize ozone – depleting substances**	• Employ insulation that is ODP (Ozone Depletion Potential) free. • HCFC (hydro chlorofluorocarbon) and CFC (chlorofluorocarbon) free HVAC and refrigeration equipments. • Halogen-free fire suppression and fire extinguishing systems to eliminate or control the release of ozone-depleting substances into the atmosphere.	V	
9	**Site Selection & Planning**	• **Access to basic amenities within site premises**	• Community facilities - anganwadi, community hall, parking facility within site premises.	M	Building designed to accommodate provisions for differently-abled
		• **Access to basic amenities outside site premises**	• Locate eco-housing site so that basic social amenities - school, health care, public transport, convenience grocery, park, post office are within 1.0 km radius from housing	V	Site plan showing site and the facilities within 1.0 km radius.
		• **Site Planning taking into account natural drainage pattern**	• Existing drainage pattern should be surveyed and site planning/ building layout to be done in accordance with that without altering the existing drainage pattern.	M	Pre-construction site survey plan showing existing drainage patterns & Site plans for proposed construction to show compliance
		• **Reduction in Heat Island Effect**	• Roof top gardens and Roof top composting • Roof Insulations	V	It is thermal gradient difference between developed & undeveloped areas.
10	**Indoor Environment Quality**	• **Day lighting**	• Achieve a minimum glazing factor of 2% in each of the living spaces. • 50% of the total floor area of all regularly occupied spaces which include kitchens, living rooms, bed rooms, dining rooms and study rooms.	M	Glazing = Window Area [SF] x Actual Visible transmittance x Constant Factor Floor Area [SF]
		• **Ventilation (Building envelop and fenestration design)**	• Fresh air ventilation 30%	M	
			• Ensure cross ventilation	V	

Benefits of Green Buildings: Energy Saved is Energy Generated

Green buildings can have tremendous benefits, both tangible and intangible. The most tangible benefits are the reduction in water and energy consumption right from day one of occupancy.

- The energy savings could range from 20 – 30 %.
- Features of building design itself, such as appropriate orientation, insulation, and shading – what is referred to as 'passive solar architecture' – can reduce energy requirements by about 10% and day-lighting, control systems, and energy-efficient lamps can bring them down by another 25%.
- The water savings can be around 30 – 50%.
- Limited Waste to landfill sites as about 40-50% of household level organic waste gets recycled and reused on-site
- As much as 40 per cent of the energy used for heating, cooling and illumination of buildings and provision of hot water and other building services could be saved by switching over to solar technology without compromising on the comfort levels of its occupants[11].
- Reduced pollution load (Carbon savings about 30%)
- Lower O & M costs

Tangible Benefits Experienced in Leadership in Energy & Environmental Design (LEED) Rated Green Buildings

Building	Area Sq.ft.	Energy Usage in Conventional Building (KWH)	Energy Usage in Green Building (KWH)	% Reduction	Annual Energy Savings (Rs in Lakhs)
WIPRO	1,75,000	48,00,000	31,00,000	40%	102
ITC	1,70,000	35,00,000	20,00,000	45%	90
CII Godrej GBC	20,000	3,50,000	1,30,000	63%	9

Note: Energy consumption depends upon local climate, density of occupancy, occupancy schedule, orientation of building and internal loads.

Source: Indian Green Building Movement, Confederation of Indian Industry

11. *The Bulletin on Energy Efficiency April 2001, Vol. I, Issue 5, V. Suresh, Chairman & Managing Director, Housing & Urban Development Corporation Ltd. HUDCO Bhawan, India Habitat Centre, Lodhi Road, New Delhi http://www.energymanagertraining.com/Journal/Need for Energy Efficiency in the Building Sector.pdf*

- Intangible benefits of Green homes include enhanced air quality, excellent day lighting, health & well being of the occupants, safety benefits and conservation of scarce national resources.

Life Cycle Cost of Energy Efficient Buildings

Innovative solutions can help in promoting energy efficiency in any building or group of buildings—old, new, or yet to be constructed.

Energy-efficient buildings require a higher investment of 29,500 rupees per square metre, as compared with 19,000 rupees per square metre for a non-energy efficient building, but offer substantial savings in energy consumption. For a 10,000 square metre hotel building with a life-expectancy of 30 years, an energy-efficient building will consume energy to the tune of 300 kWh/m2(kilowatts per hour per square metre) as compared with a non-energy-efficient building that will need 500 kWh/m2 of energy. The Net Present Value is calculated to be positive at 8.1 million rupees, with an electricity tariff rate of 6 rupees/kWh, and a discount rate of 10%. A TERI study of 18 premier hotels in India found that energy conservation measures can lower electricity bills by 15% to 20% (Year 2006)[12].

Performance of Green Building in India:
Increase in Capital Cost v/s Payback Period due to Savings in Operating Cost

Building	Year Awarded	Built-in Area (Sq.ft.)	Rating Achieved	% increase in cost	Payback Years
WIPRO, Gurgaon	2005	1,75,000	Platinum	8%	5
ITC Green Center, Gurgaon	2004	1,70,000	Platinum	15%	6
CII Godrej GBC, Hyderabad	2003	20,000	Platinum	18%	7
Technopolis, Kolkatta	2006	72,000	Gold	6%	3
Spectral Services Consultants Office, Noida	2007	15,000	Platinum	8%	4
HITAM, Hyderabad	2007	75,000	Silver	2%	3
Groundfos Pump	2007	40,000	Gold	6%	3

Note: Energy consumption depends upon local climate, density of occupancy, occupancy schedule, orientation of building and internal loads.

Source: Indian Green Building Movement, Confederation of Indian Industry

12. REPORT ON ENVIRONMENT SECTOR IN INDIA, p-11, Indo Italian Chamber of Commerce & Industry in Mumbai (India) on November 2006

Photovoltaic cells, new appliances and modern technologies tend to cost more money. Most green buildings cost a premium ranging from 2%-12% (in India), but yield 10 times as much over the entire life of building. The savings come from more efficient use of utilities which result in decreased energy bills[13].

Although the above illustrations, indicating life cycle costing, are from commercial or institutional or corporate projects it has great significance and potential for replication in large scale residential projects.

Though Green Buildings offer huge savings in environment and operating costs (savings in energy, water etc) the development of Green Buildings have not picked up fast pace in realty - residential and commercial development sector. The barriers accounting for the aforementioned are narrated below.

Barriers to Green Building Development in India[14]

- High cost of raw materials for a Green Building, in turn increasing the overall investment cost by up to 7% in comparison to that of a conventional building.

- Important green materials such as low water flushing toilets, waterless urinals, low VOC adhesives and sealants, certified carpets, certified woods and high albedoroof paints are not available indigenously and need to be imported (CII-Godrej GBC).

- Additional capital investment in the installation of a Building Management System (BMS) for proper control, monitoring and recording of relevant parameters affecting energy performance of electro-mechanical systems of the building.

- Recurring expenses towards operations and maintenance of the energy efficient electrical systems and the BMS.

- Benefits of efficient building systems and design solutions will not be borne by those who bear the incremental capital cost.

- Occupiers are reluctant to pay premium in rentals for leased spaces[15].

- In order to attain occupancy in a competitive market, real estate developers would have to meet the prevailing market rates.

To achieve environmentally sustainable buildings need not be cost intensive. By applying appropriate low cost measures and cost-effective technologies the desired level of Green Building performance can be achieved. Though there is an initial upfront investment to implement Green Building features, the return on investment has been proven over time

13. A.K. Garg 2011, Journal of Engineering, Science and Management Education, Financial Aspects of Green Buildings
14. Green Building: Potential to Earn Carbon Credits, Deloitte, February 2010
15. Source: 2009 Core Net Global and Jones Lang LaSalle global survey on Corporate Real Estate and Sustainability

on various projects Pan India both in GRIHA and LEED certified buildings.

It is worthwhile to mention here that there is a need for implementing demonstrative Green Building and Eco-housing pilot projects in residential sector (Mass Housing, Residential townships etc) to showcase the tangible and measurable results.

Embarking on above, the following elucidates various low cost and cost effective measures that can be taken up for designing eco-housing.

Cost Effective Green Building and Eco-Housing Measures

The eco-housing measures are judicious combination of appropriate technologies of building design and construction that are both economical and environment friendly.

- Environmental Friendly Technologies
  - Rain Water Harvesting
  - Onsite Solid Waste Disposal
  - Composting latrines in areas not connected to sewers
  - Onsite waste water disposal system
  - Recharge/ recycling of waste water

- Energy Efficiency through Solar Passive Architecture
  - Passive Heating and Cooling
  - Building Orientation
  - Building Envelope and Fenestration Design for ample natural indoor lighting and ventilation
  - Planning and design for optimized space utilization, natural ventilation and illumination

- Use of Renewable Energy to save energy consumption
  - Solar Heating
  - Roof Surface Evaporating Cooling
  - LED lighting for energy efficient indoor comfort

- Use of Cost Effective Building Materials and Building Technology.
  - Vernacular Building Material – Efficient use of locally available materials, agro-industrial wastes and salvaged materials in masonry blocks, boards and tiles.
  - Use of Agro-industrial wastes in production of building materials.
  - Production of clay bricks using fly ash, rice-husk,etc in semi-mechanised, fuel efficient and environment friendly brick kilns.
  - Pollution abatement devices for Brick, Gypsum and Lime Kilns.
  - Pre-fabricated building components with optimized use of natural resources and low embodied energies.
  - The technology for alternative building materials for low

cost housing must be energy efficient and environmental friendly.

The following elucidates the key green building & eco-housing features that can be easily adopted in affordable mass housing constructions.

a. Water Efficiency

Rainwater Harvesting

Description: Rainwater collection and storage can be supplementary water source for the domestic water usage. Collect runoff water from roof top and store in underground storage tank or in percolation tank.

Benefits: Rainwater harvesting is beneficial for places like India where water scarcity is a major problem. In harsh climate zones like Rajasthan rainwater harvesting ia extremely beneficial as it provides water for domestic use. It also helps in enhancing ground water recharge.

Water Efficient Fixtures

Description: Use water efficient fixtures like flush tank of taps. This will reduce the unnecessary waste of water.

Benefits: It will ensure the water conservation by reducing water wastage

Use of Permeable Paving Materials

Description: Provide permeable paving in parking and walkways or pathways. This will allow storm water to percolate into soil.

Benefits: It will enhance the ground water recharge and successively will reduce the soil erosion due to rain water runoff. It will also reduce heat island effect, which usually occurs due to extreme heating of horizontal paved surfaces.

Water Efficient Landscapes

Description: Use Low-water landscape designs and elements (such as xeriscape and native plants) so that it reduces water use.

Benefits: It will reduce the maintenance cost of landscaping and it will also reduce load on water system.

b. Wastewater Management

Decentralised treatment and reuse of water

Dewats

Description: Include Dewats (decentralized wastewater treatment systems) to ensure that wastewater generated in community gets treated sustainably. Recycled water can be used for gardening of community spaces.

Benefits: It is environmentally and economically sound treatment system. It requires least operation and maintenance cost as compared to other systems. Also the recycled water can be used for gardening purpose

c. Solid Waste Management

Waste minimization, reuse and segregation

Description: Individual household shall take initiation in reducing waste at domestic level and where possible shall adopt recycling of waste. Organic waste and non-organic waste shall be segregated at domestic level. Individual household shall have two dustbins to cater to organic and inorganic waste.

Benefits: This can improve efficiency of organic waste treatment systems. It also reduces the quantity of inorganic waste.

Treatment to organic waste; Vermi-composting

Description: Vermi-composting plant to treat organic waste generated in community. Thus land allocation shall be made at the time of site planning. For in-situ development land in the proximity shall be allocated for vermi-composting. Workers for the vermi-composting activities can be hired from respective area. So that it also generates employment.

Benefit: Vermi-composting is environmentally as well as economically sustainable treatment method. Capital cost required is also low thus it is good for the low cost developments.

Treatment to organic waste; Waste to Energy

Description: At community level organic waste can be used to generate electricity. The generated electricity can be used for lighting community spaces like roads and gardens. In case of redevelopment model prior arrangement for the land shall be made while site planning.

Benefit: This treatment method saves conventional electricity and thus abates GHG emission occurring due to electricity generation from conventional methods.

Treatment to organic waste; Biogas Plants

Description: Install biogas plants at domestic or community level. Land allocation of individual dwelling unit plan shall be made considering the choice of treatment method. If domestic biogas plants are to be installed then provision shall be made.

Benefit: It saves the usage of domestic LPG gas. Even if certain cost is involved in establishment, it proves economical as it saves domestic LPG

gas. It is also environmentally beneficial as it reduces methane emission due to organic waste, which is one of the GHG gases responsible for global warming.

d. Energy Efficiency

Energy Saving Measures in appliances and CFL lighting

Install Compact Fluorescent Lights (CFL lighting)

Description: Use CFL bulbs for interior lighting. CFL produce light quality and quantity that is comparable to incandescent lights, while consuming less electricity.

Benefits: CFLs are more expensive than incandescent lamps but due to their substantial energy saving, they prove economically beneficial in the long run.

Use Energy Star Appliances

Description: As far as possible usestar labeled energy appliances. Higher Star labelled appliances consume less energy.

Benefits: They consume less energy thus cut down on electricity bills.

e. Renewable Energy Efficiency

Solar Water Heater

Description: Use Solar water heater for hot water requirement. These can prove to be beneficial in India where most parts receive ample solar energy. Solar water heaters are usually installed on roof tops.

Benefits: On an average saving could be taken as 1200 units/year/100 lpd system and 100 lpd can serve one household. Thus it reduces the energy consumption cutting electricity bill.

Solar Home System

Description: Solar home system installed for each household. It is a device to power lights, fans, and small TV sets in homes. Solar home systems are available in capacities of 18W, 37W, and 74W.

Benefits: It reduces dependence on conventional electricity and thus reduces cost incurred in construction of electricity lines. It proves beneficial where constant dependence on conventional electricity is not possible or in areas subject to load shedding.

Solar Outdoor Lighting

Description: Install Photovoltaic solar lighting in outdoor areas. These lights use solar energy and store it, so that it can be used during nights.

Benefits: It reduces load on conventional electricity. It also reduces cost incurred in construction of electricity network.

f. Sustainable Building Materials

Use Low or Non-VOC paint

Description: Non-VOC paint does not emit odours related to volatile organic compounds (VOCs). Organic chemicals are widely used as ingredients in household products like paints, adhesives and cleaning supplies. Non-VOC paint is used exactly like conventional paint and is suitable for indoor use.

Benefits: Use of low or non-VOC paint can eliminate the irritation caused to eye, nose and throat by VOC. If applied outside VOCs can bond with other pollutants and create ground-level ozone

Use of recycled material for construction

Description: Whichever construction activity permits, incorporate recycled materials. Demolished materials can be used in many construction activities.

Benefits: This practice proves to be environmentally sustainable as it prevents pollution due to production of materials.

g. Site Selection and Planning

Access to Basic Amenities within Site Premises

Description: Provide access to basic amenities such as community facilities - anganwadi, community hall, parking facility within site premises.

Access to Basic Amenities outside Site Premises

Description: Locate eco-housing site so that basic social amenities - school, health care, public transport, convenience grocery, park, post office are within 1.0 km radius from housing
Taking into account Existing Drainage Pattern

Description: Existing drainage pattern should be surveyed and site planning/ building layout to be done in accordance with existing topography without altering the existing drainage pattern.

Domestic Roof Top Gardens

Description: Make provision for roof top garden. If structure is already built, then plant in planters placed on roofs. Depending on the location of the site, choose specific native species of plants. Kitchen waste can be used as manure and composting can be done on the planters.

Benefits: Gardening/ planting on residential roof tops will help in reducing the heating of interior of the house. It also assists in reducing the heat island effect.

h. Indoor Environmental Quality

Orient Building to Maximize Natural Day Lighting

Description: Orient Building so as to achieve optimum day lighting and reduced direct harsh sunlight. Also, as per the climatic condition of the place, orient buildings to reduce or gain solar heat.

Benefits: It will reduce load on the artificial ventilation and lighting. It will also ensure the healthy indoor environment.

Natural Ventilation through Windows placed on appropriate side

Description: Place windows to take advantage of prevailing winds and thermal convection to ventilate living space.

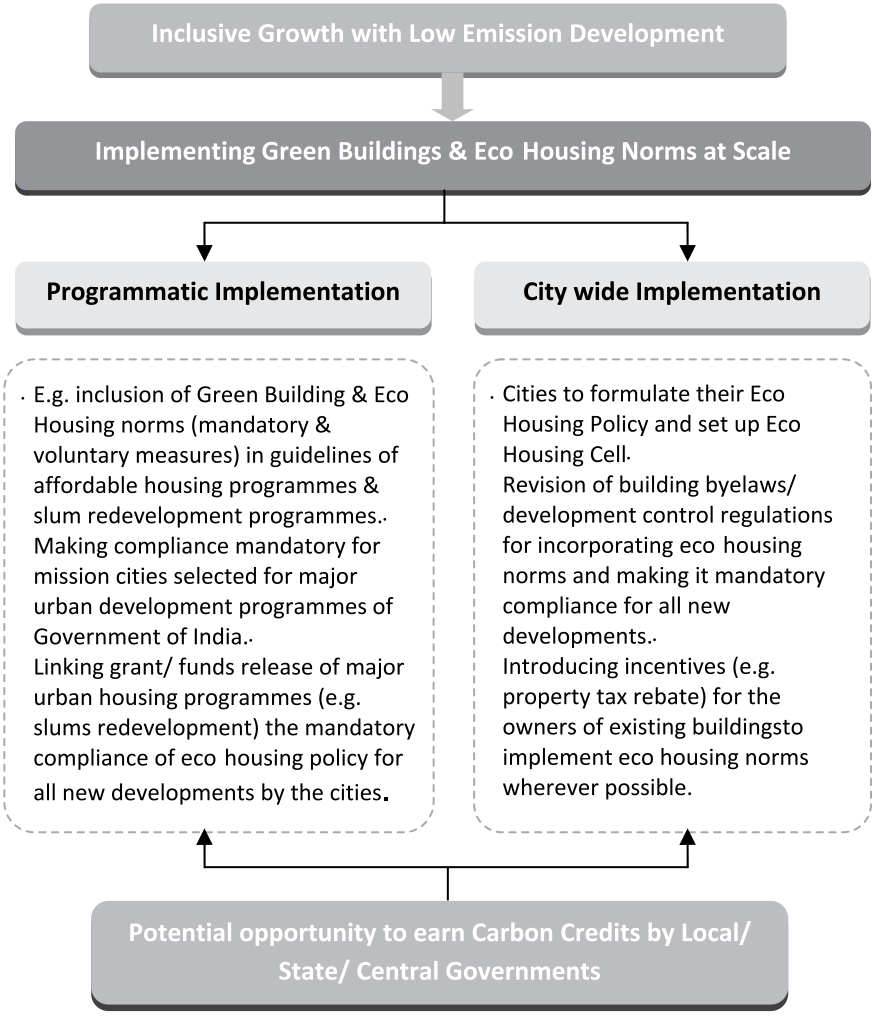
Benefit: It will reduce load on artificial ventilation and cooling systems. This can save money on electricity bills and can make interior more comfortable.

Policy Implications for State and Central Government

There is a need to promote integrated development to pursue a low emission, inclusive growth trajectory with support of Ministry of Housing & Urban Poverty Alleviation, Ministry of Urban Development and Ministry of New &Renewable Energy. Implementing Green Building and Eco-Housing norms at scale,for mass housing programmes undertaken by the Government and individual houses apart from commercial and institutional buildings, will lead to reduced GHG emissions, savings in energy and reduction in consumption of non-renewable resources. This also presents a potential opportunity to earn carbon credits by local/ state/ central governments.

The author has proposed two models for implementation of the Green Building and Eco-Housing norms at scale through:

- Programmatic Implementation: Inclusion of Green Building norms (as mandatory and voluntary measures) in Government's affordable mass housing programmes. Also making its compliance mandatory for mission cities selected for major urban development programmes of Government of India. Linking grant/ funds release of major urban development programmes on creation of mass housing (e.g. slums redevelopment) with the mandatory compliance of eco-housing policy for all new developments by the cities.



- City wide implementation: Cities to formulate their Eco-Housing Policy and set up Eco-Housing Cell for implementation of the same. Cities to appropriately revise building byelaws / development control regulations for incorporating eco-housing norms and making it mandatory for compliance for all new developments. Introducing incentives (e.g. property tax rebate) for the owners of existing buildings (housing societies,

individual residences, commercial & institutional buildings) to implement eco housing norms wherever possible (e.g. on site waste management, roof top rain water harvesting etc).

The following puts forth the policy implications for Central and State Government.

1. The plan of action to be prepared at state level that outlines the necessary legislative and administrative changes, modification in town planning regulations to stipulate Green & Eco-Housing features in all new developments. Also State Governments to facilitate modifications in existing building byelaws and procedures to facilitate and incentivise Green Buildings and Eco-Housing.

2. Establishment of state level Eco-Cell in Urban Development Bodies to offer advisory services.

- Develop Green Building Agenda for all Housing sections – High Income Group, Middle Income Group, Low Income Group and Economically Weaker Sections for inclusive and sustainable development.

- Strengthen implementation and monitoring mechanism to bring accountability of Urban Local Bodies.

3. Municipal Bodies (Urban Local Bodies) should be empowered to take up Green Building initiatives.

- Formulating and implementing local environmental codes/ bye-laws need to be given greater importance to account for city-specific environmental concerns.

- Internalising climate change in land use planning and regulations should be given priority under the present context of global warming to address the issue of sustain ability of cities.

4. Establishment of Green Building Technology Promotion Centre is also necessary to encourage the use of locally available and sustainable environmental friendly building materials.

- Technological options to be developed and promote to develop sustainable and affordable water, sanitation and wastewater management systems.

- Documentation & dissemination of Good Practices for cost-effective Green Building design and technologies needs to be done which encourages innovations on this front.

Recommended Reforms for Implementation at City Level:

Based on the actual implementation of Green Building components at different scale by various cities (Pune, Nagpur, Mumbai) the following city level reforms are listed for implementation of Eco-Housing and Green Building principles.

1. Establishment of city level Eco-Housing Cell for effective implementation of eco-housing norms.

2. Revision of Municipal Building Byelaws/ Development Control Regulations (DCRs) to incorporate Eco-Housing and Green Building norms. Residential buildings (public and private) should be complaint with green norms.

3. Interventions for Water Conservation, Solid Waste and Waste Water Management:

3.1. Rain Water Harvesting and recharge to be made mandatory in all new large housing complexes, institutional buildings, commercial complexes and industries by making revision in building byelaws. Cities can also be encouraged to get a part of the water supply from rain water harvesting systems – storage or recharge.

3.2 Water efficient fixtures (taps/ faucets, flushing tanks, water closets, urinals, bidets and bath tubs) may be promoted through citizen information as well as fiscal incentives.

3.3. Waste water recycling and reuse to be made mandatory

a. Cities to be encouraged/ mandated to meet part of their water supply for non-drinking purposes and/or at least for industrial use, by recycle/ reuse of treated sewage. Incentives to be provided to consumers (through water tariff, property tax etc) for the recycle and reuse of treated wastewater.

b. Making it mandatory for municipalities, large housing complexes, commercial complexes, institutional buildings and industries for setting up waste water treatment plants for recycling and reuse of treated water.

3.4. Introduce onsite solid waste management – recycle and reuse of waste.

3.5 ULBs making it mandatory to conduct periodic energy audit and water audit for all buildings/ housing and commercial complexes, industries, educational and office complexes etc.

4. Energy Efficiency Interventions: Municipal building byelaws to be revised to become complaint with norms of resource conservation (energy) and Renewable Energy integration (solar water heating, meeting part energy demand by use of renewable energy resources such as solar, wind and biomass).

5. Introduce Fiscal Incentives

5.1 Provide erebates in property tax to building owners for Green Buildings. ULBs can also provide rebate in water tariff/ energy tariff for demonstrating water/ energy savings in Green Buildings.

5.2. Provide incentives on development charges and rebate on premium charges to developers for developing IGBC/ LEED rated projects. (IGBC and LEED ratings are most prevalent in India)

5.3. Introducing penalty for non adherence with mandatory Eco-housing norms as per provision under Bye-laws.

5.4. Simple legal approval process for Green Buildings and fast track approval for IGBC/ LEED rated green projects. Have a single window clearance (as per NBC) for Green Building projects approval.

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Decentralised Solid Waste Management: a step towards cost effective green buildings

Swati Sonavane

Introduction

Urbanisation and rapid pace of development in Pune have resulted in increased generation of waste. About 70% of the waste is domestic waste generated from households. This puts significant burden on centralized system of waste management, viz. collection and transportation. Although the Pune Municipal Corporation (PMC) treats 1000 tonnes of waste daily, a sizeable portion of garbage remains unprocessed. Another challenge is segregation of waste at source which is essential for increased efficiency for waste treatment. Segregation of waste at source although prevalent and practiced by PMC, extent of segregation at source is low at 31%.

To reduce the burden on centralized solid waste management the PMC has adopted a decentralised pattern of solid waste management at ward level and made it mandatory for large residential and commercial complexes – to segregate, process and recycle waste at source. Dry waste is collected by the rag pickers and other NGOs for recycling. And wet waste is processed through vermin-composting and biogas plants. Due to such decentralised segregation and recycling of waste; the waste for final disposal has been reduced considerably. The PMC is promoting this technology through public participation and by creating public awareness. There is a good response from the citizens; once implemented at the local level by all citizens, the waste at final disposal will reduce to a large extent.

Initiatives by Pune Municipal Corporation for Decentralised Waste Management

In Pune, a number of initiatives have been undertaken at household as well as society level for wet waste processing under the mandate of

Municipal Solid Waste Management & Handling Rules, 2000. There are various facilities set up for processing of wet waste at community level. These processing methods predominantly include both Biogas generation and Vermi-culture practices. It is estimated that about 30 tonnes of waste is being treated using these options throughout the city. PMC in the past has promoted the use of vermi-composting at community levels by introducing the need for having a vermi-composting pit for newly developing areas. The Development Control Regulations of the Pune area require provision of vermi-composting pits in order to obtain the No Objection Certificate (NOC) from the Health Department of PMC. Vermi-composting has been a predominant method that many housing societies have followed; however of late, biogas generation through anaerobic digestion is becoming a more popular route for treatment and disposal of the wet waste generated in large residential premises.

As a part of Implementation of guidelines of Maharashtra Pollution Control Board and Municipal Solid Waste Management & Handling Rules, 2000, the Pune Municipal Corporation has implemented ward-wise Decentralized Biomethanation-cum-Power Generation Plants to process and dispose of segregated organic Municipal Solid Waste. This includes wet waste generated from household kitchens, hotels, hostels, restaurants, resorts, community kitchens, industrial canteens and fruit &vegetable markets.

- Wet waste composting (approx. 1400 units) at household level and by decentralised mechanism and systems.
- Setting up Bio-gas plants in large residential housing complexes and housing societies. So far 40 bio-gas plants in societies and townships have been established in Pune.
- There are 12 decentralized biomethanation-cum-power generation plants operating in the city at ward level which treat around 60 tonnes of wet waste daily as per the available records.
- Adoption of waste-to-energy plants for multiplexes, hotels, restaurants and big townships.
- 35 organic waste converters are treating 15-20 MT of solid waste per day.

Source: City Sanitation Plan of Pune, 2011

Location: Mahatma Co-operative Housing Society, Kothrud, Pune
Total Bungalows: 325
Total area of society: 72 acre 10 Gunthe

Treatment Plant Specifications

Total waste generated per day: up to 600 kg
Composition of waste: Dry-40% and Wet 60%
Plant operational since: July 2010
Total area of plant: 4000 sq. ft.
Constructed By: Prakruti Agro Envhiro Tech
Total Capital Cost: INR 11 Lakh
O and M Cost: RS 11000 -13000/ month

Case Study: Vermi Composting at Community level

The 'Vermi-composting Model' which can convert biodegradable waste from households and garden waste into compost at its source is established by the Mahatma Housing Society. The facility treats the 600kg of waste generated from 325 households. The organic manure thus obtained is used in gardens and the remaining is sold to generate revenue.

Plant Requirements:

- Space requirement – up to 4000 Sq. ft.
- Segregation of waste into dry waste and wet waste.
- Shredder
- Organic waste converter
- Composting shed
- Metal Racks
- Two Bins to collect segregated waste

Type of waste required:

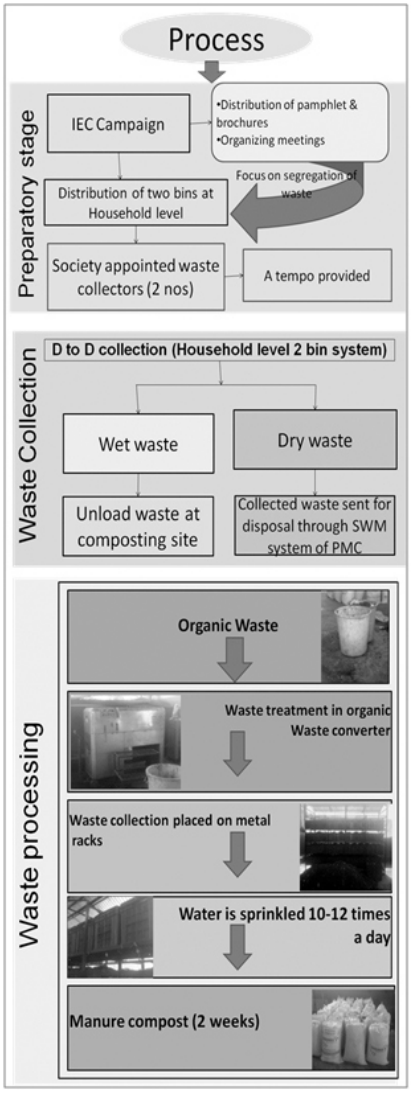
- Wet waste, green waste only
- Dry waste gets collected by PMC

Requirement of human resource:

- 2 persons appointed by society for day-to-day collection
- 1 person (non-technical) appointed by private agency for operation and maintenance of the plant.

Description of the Initiative:

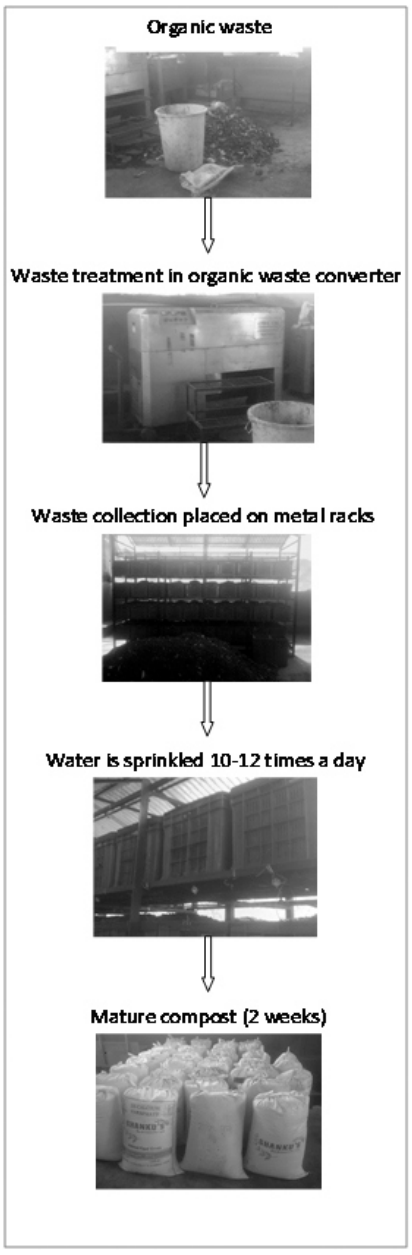
Mahatma Society in Pune has established a composting plant with the objective of onsite waste management.



It focuses on 100% organic waste treatment at source and thereby reducing pressure on the existing centralized solid waste management system. It also encourages recycle and reuse of treated waste.

Large housing societies and developers of the under construction and new housing projects are required to establish/construct waste treatment facility at small scale within residential premises. This has been mandated by the PMC as per their Eco-Housing Policy.

Under this project, approximately 650 kg of waste generated every day within society comprising 325 bungalows is collected daily. Door-to-door waste collection and segregation of waste at household level is practiced. Thereafter, the segregated wet waste is shredded with the help of the shredding machine installed at the project site. The shredded waste is placed inside the compost convertor where it is sprinkled with bio-cultures that help speedy composting of the waste. The compost is ready in two to three weeks and is utilized for garden within the society premises. The excess compost is packaged and sold by the society in the open market. This practice has led to effective waste management and generation of revenue for the housing society.



Total wet waste generated (approximately): 2kg per household* 325 householdss= 650 kg/day

Total compost generated: 100 to 150 kg per month

Total revenue generated: Rs. 22500/- (1500 per month* 15 months)

Special efforts taken for door-to-door waste collection and segregation: Society has distributed a 'Paripatrak' which indicates the instructions for segregation of waste at household level. The personnel appointed by the society have been asked not to collect mixed waste.

Provision of two bins: Society has provided two bins from the society funds for collection and storage of segregated waste.

Fixed waste collection timing: 9 am to 5.30 pm.

Quality control mechanism: In order to control quality the housing society periodically sends the manure for compost analysis at laboratory.

Packaging and selling of compost: The packaging and selling of the compost is done by the persons appointed by the agency on behalf of the society.

Disposal of dry waste: Dry waste generated in the society gets collected by PMC.

Advertisement for compost selling: Advertisements are placed in local newspaper (Kothrud Parisar) to improve sales of compost.

The roles and responsibilities have been divided between the contractor, society and residents as follows:

Duties of private contractor:

- Managing of the internal roadside foliage waste
- further segregation of waste received at the compost plant site
- Provision of technical assistance for operating the plant
- Packaging of the compost produced

Duties of the society:

- Provision of land and shed for setting up the plant
- Awareness creation among the society members
- To make available electricity and water at the site
- Provision of the machinery for the operation
- Door to door waste collection
- Compost sale

Duties of the residents:

- Segregation of waste into dry and wet waste
- Use of two bin system
- Monthly payment of maintenance charges

Design and planning considerations:

- The provision of land for the compost plant to be made at the building plan and approval stage by the local governing body.
- Augmentation of plant capacity is possible.

Financial aspects:

- Capital Cost: The total cost of setting up the plant is approximately Rs.13.12 lakh. The capital cost is met by society funds and not generated from members' contribution.
- Operation and Maintenance Costs: The recurring expenditure is towards chemicals, electricity and remuneration for plant operators and door-to-door waste collector. It comes to around Rs 12000 per month. It is recovered from each house hold in the form of society maintenance charges which also includes operation and maintenance of the plant.
- Revenue income is more than the expenditure.

Item	Cost (INR)
Capital Cost	**13,01,200**
Shed	4,00,000
Organic Waste Converter and Shredding machine	9,00,000
Weighbridge	1,200
O and M Cost per Month	**11,300**
Maintenance cost per household per month	500
Wages of 2 workers appointed by the society per month	10,000
General Electricity expenses paid by society per month	800

- Revenue income is more than the expenditure.

Operation and Maintenance:

- The society has given the contract (operation and maintenance) for conversion of waste to compost to a private contractor Prakruti Agrotech, Pune. The contract is awarded for a period of one year and is renewed each year.
- It is the responsibility of the plant operator to operate the plant, segregate the waste and package the compost.

Process:

Awareness Creation:

The society has undertaken awareness creation activities like distributing pamphlets, brochures, and meetings with the residents before starting up the project.

Door-to-door waste collection & segregation:

The residents are requested to segregate waste into two components: dry waste and wet waste in two bins. As a result, the residents provide segregated waste to the waste collectors appointed by the society management. Two persons are appointed by the society for the same. A tempo is also provided to these persons. They collect both dry and wet

waste from the residents, and unload only wet waste at the composting site while dry waste is discarded at the PMCs' disposal site.

The contractor has appointed 6 persons for collection of foliage along the road. This waste is also collected by the vehicle and stored at the composting site.

Composting Process:

The wet waste is received by the person appointed by the contractor at the composting site. The organic waste converter cannot crush leaves and coconut shells, egg shells, etc. Hence, a secondary segregation process is carried at the site by the plant operator and then the waste is put into organic waste converter (OWC). The waste converter churns the material for 10-15 minutes and the output received is collected in plastic baskets which are then placed onto metal racks. Water sprinklers are attached to the metal racks. Water is sprinkled on the produce 10-12 times in a day. After 2 weeks, mature, odour-free compost is formed. It is taken out from the baskets and packed into bags of 25 kgs each. The society has provided weighbridge for weighing the bags. The compost is sold at Rs. 5 per kg by the society.

Quality Control Mechanism:

A quality control mechanism is established wherein the compost /organic manure produced is sent to a laboratory for compost analysis.

Management:

- A dedicated plant operator is needed
- The success of the operation depends on the willingness of residents to segregate waste
- Plant site needs to be covered and protected from sunlight exposure
- Continuous operation necessary for smooth running of the plant
- Requires relatively high capital expenditure

Results of Technical Report of Compost

S.No.	Parameters	Unit	Results
1	Total Nitrogen (as N)	mg/kg	10262.35
2	Phosphorus (as P)	mg/kg	5173.84
3	Potassium (as K)	mg/kg	17268.21
4	pH (5% aqueous)	-	7.9
5	Total Organic Carbon	mg/kg	371910.3
6	Total Organic Matter	-	64.12

Outputs:

The organic waste treatment produces compost as end product which is used as manure for garden. The excess remaining manure is sold as packaged compost.

Advantages:

- Minimal operation and maintenance cost
- Limited involvement of private contractor is helpful for smooth working
- Society management solely accountable for the plant operations
- Follows PMC's mandate of eco-housing policy and hence each member household receives tax rebate on property tax
- Segregation of waste at door-to-door level achieved through this

Learnings:

- Waste management should primarily be focussed at household level for sustain ability and cost effectiveness.
- Citizens respond positively to the policies of the local bodies and are willing to contribute for the betterment of the city.
- Decentralised on-site waste management has helped in reducing load on centralized solid waste management system.
- The waste is generally generated at household level and also at community level e.g. garden. In order to properly manage this waste with minimum effort and cost, focus must be on management at the house hold level. The waste which cannot be managed at household level and that collected from marketplace should be handled at the community level.
- Composting as technology option for treatment of Biodegradable Waste
- Decentralized waste treatment also encourages reuse of recycled and processed waste.

Caselet: Decentralised waste management by Vedvihar society, Pune

A society of approximately 300 flats in Pune, has also initiated similar intervention for solid waste management. The builder of the society has provided 21 pits for treating waste at source. To avoid problems like foul odor, mosquitoes and flies, the society is using an organic sprayer named "Biosanitizer". The society has also tied up with "SWACH" a ragpickers' association for daily collection of recyclable materials. Two sanitation workers are appointed for daily door-to-door collection of segregated waste. The compost obtained is used in the gardens of the society and by individual residential flat owners.

Limitations:

- Currently the organic waste converter installed at the site is unable to degrade the leaf/foliage waste collected from the roadside. The Mahatma Society management has already purchased a shredding machine for crushing of foliage waste.

Challenges:

- Relatively high capital investment deters the housing societies from establishing the waste processing facility in cases where such facility is not provided by the developer.
- Many of such initiatives are often shut down because of no ownership towards regular operation and maintenance by the community.

Replicability:

One of the advantages of this compost plant is that it can be planned and set up after even the society has been established. It could be replicated where provision of land, water and electricity to the site could be made available and where residents are willing to participate. The system could be modified according to the need.

Caselet: Decentralised waste management by Magarpatta City, Pune

Similar initiative has been started in a township named Magarpatta City, Pune. The "Waste to Energy" project has been undertaken by the 'Property Management Services Department (PMS)' of the Magarpatta City. The garbage collection, segregation, processing is entirely looked after by the society. The processes of waste treatment include biogas generation, vermin-compost and use of organic waste converter. The manure produced is utilized for gardens, green areas, plant nursery and to grow organic vegetables for the residents.

Sustainability:

The factors that contribute to the increased sustain ability of the set up are as follows:

- Community initiative is the key driver for the success of the composting plant. Community ownership towards operation and maintenance and willingness to participate and contribute towards the construction of the facility has enabled its sustain ability. The Society is optimistic about processing entire waste generated within the area including foliage and garden waste.

- PMC has made it mandatory to segregate and dispose the waste at source for all new developments of large scale including residential and commercial.
- To enforce it, the PMC has stopped collection of waste from large residential societies.
- PMC has introduced tax exemption policy for eco-friendly initiatives like rain water harvesting, vermi composting and solar system installation.
- Advantages/Incentives for the residents: The construction of the compost plant in the society is in accordance with PMC's eco-housing assessment guidelines. Therefore, individual households in the society are eligible for rebate in property tax.

The practice followed at the society is one of the efficient ways of waste management at the residential level. Moreover, the involvement of private partner facilitates conversion of waste into compost without putting any extra onus on either the society or the residents. In addition, the limited involvement makes the society accountable for rest of the waste management process. This is necessary to sustain the practice for a long time. Even though the machinery is expensive, the investment is one time. Also, the plant requires minimum operation and maintenance. Hence, once the investment is made, no further expenditure is required. Thus, after a few years of setting up the plant the money could be recovered and then the rest is profit for the Society from the sale of compost. Since, PMC offers rebate in property tax to the residents of the society having such type of interventions, the chances of the system being sustainable are increased manifold.

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Book Review

Handbook of Statistics

Published by
Government of India, Ministry of Urban Development
Pages xiii plus 363.

Urbanization is a global phenomenon, a migration of people from villages to cities in search of jobs or self-employment opportunities. Economic and social forces are behind this pull. A substantial proportion belonging to economically weaker sections stay put in cities even in the face of hostile conditions which is itself a long discourse. For others, cities are a beacon of hopes for a better life. The 2014 revision of the World Urbanization Prospects by UN Department of Economic and Social Affairs (DESA) Population Division notes that today 54 per cent of the world's population lives in urban areas, a proportion that is expected to increase to 66 per cent by 2050. Projections show that urbanization combined with the overall growth of the world's population could add another 2.5 billion people to urban populations by 2050, with close to 90 percent of the increase concentrated in Asia and Africa, according to the report. Europe and North America which were forerunners in the industrial and economic development, were first to become urbanized. From the second half of the 20th century it is now the turn of African and Asian countries to catch up with them. It is not a matter of emulating others, but is a reality of human life and settlements to achieve desired level of industrialization and economic development- a matter of aspirations for a better life. The report further notes that among the African and Asian countries, the largest urban growth will take place in India, China and Nigeria. These three countries will account for 37 per cent of the projected growth of the world's urban population between 2014 and 2050. By 2050, India is projected to add 404 million urban dwellers, China 292 million and Nigeria 212 million."Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda," says John Wilmoth, Director of UN DESA's Population Division.

According to the Ministry of Urban Development, Government of India, India is in the midst of transition from a predominantly rural to a quasi urban society. Urbanization in India has become an important and irreversible process, and an important determinant of national economic growth and poverty reduction. The process of urbanization is

characterized by a dramatic increase in the number of large cities. At current rate of growth, urban population in India will reach a staggering total of 575 million by 2030 A.D. According to Census 2011, as many as 52 Cities in India had population of a million plus.

Statistics is the study of the collection, analysis, interpretation, presentation, and organization of data. It is a basic tool for knowing the present state of affairs, analyzing its features and making projections for future growth, which captures the state of affairs and trends in the figures collected, compiled and arranged for desired study. The figures speak volumes. This mathematical science is inseparable with economics or with any social study for that matter. This is the heyday of statistics. Census India is a huge statistical exercise where very large data is collected by tens of thousands of enumerators throughout the length and breadth of the country and collated by thousands of statisticians and finally brought out in tomes. This is valuable data that the country relies on for future planning, and is indispensable for a great number of studies. Yet the fact remains that some further specific data is necessary to know the state of affairs of urbanization. In this background, publication of Handbook of Urban Statistics 2016 by the Government of India, Ministry of Urban Development is highly welcome. This is under review. The Introduction of the Handbook acknowledges that "at present, data on various aspects of urbanization is brought out by different agencies and there is no compendium of statistics on urban development. It is imperative to have concrete and reliable datasets to help formulate appropriate policies. However, non-availability of authentic and reliable data in an easily accessible manner has often been one of the important constraints to informed policy making and also for the researchers studying diverse aspects of urban development in India. A need was, therefore, felt for a compilation of data related to urban sector, which would also facilitate comparisons across various countries and across states within India. The 'Handbook of Urban Statistics' aims at fulfilling this need."

Urban Demography: Chapter 1 is on Urban Demography with a concise text, 15 tables and 12 graphs. Relevant figures of States and UTs are well tabulated. The level of urbanization in India as a whole was 25.73% in 1991 which rose to 31.14 %, with an Annual Exponential Growth Rate of 2.76% with reference to 2001. Comparative figures of BRICS are: Brazil (85.4%), Russian Federation (73.9%), China (54%) and South Africa (64.3%). This bears out the statement of the Ministry of Urban Development that India is in the midst of transition from a predominantly

rural to a quasi urban society. The number of Urban Agglomerations (UAs) rose from 374 in 1991 to 474 in 2011. India has an Infant Mortality Rate in Urban Demography (2010-2015) of 44 deaths below 1 year per 1000 births, as compared to the relevant figures of: Africa (64), Asia (31), Europe (6), Latin America (18), North America (6) and the world (37). Proportion of slums in urban population is an indicator of the failure of urban and housing policies. As of 2011, Maharashtra leads the percentage of slum population to total population with 18%, followed by Andhra Pradesh 16%. Punjab and Odisha have this proportion as 2%. In absolute terms we have 65,494,604 persons living in slums (2011) not a comfortable picture.

Socio-economic indicators of Urban India: These indicators broadly comprise education, health, gender, poverty, housing amenities and other development indictors. Chapter 2 has 7 tables and 6 graphs with data taken from the Census India (2011) and the estimates of National Sample Survey (NSS) 69th Round in 2012. The position of access to electricity in urban India stands at 97.7% of households. The figures of households with access to the source of drinking water taken from the Census 2011 stand at 91.4% However, there are wide inter-State disparities with Chandigarh at the top position of 99.4% as against the lowest level of Lakshadweep of 20%. Literacy rate in urban India has shown an improvement from 73.08% in 1991 to 79.92% in 2011 with Mizoram and Kerala topping the list having 97.6% and 95.1%, whereas Uttar Pradesh and Bihar lag behind with 77.1% and 76.9% respectively. Bias against girl child had become a matter serious concern which necessitated passingthe Pre-Conception and Pre-Natal Diagnostics Techniques Act, 1994, a penal law to stop female infanticide. Sex ratio (females per thousand males) in urban India which was 894 in 1991 showed improvement to 929 in 2011. Kerala, Puducherry, Manipur and Meghalaya had more women in urban areas than men with sex ratios of 1091, 1042, 1026 and 1001 respectively. Incidence of poverty in urban areas is showing steady improvement. In 2004-05 the proportion was 25.5% which came down to 13.7% in 2011-12.

Urban Employment: Able hands need work. Employment generation is one the main challenges for the policy makers. The share of agriculture in GDP has declined significantly, but agriculture continues to the major occupation in India. Disguised employment from agriculture sector needs to be shifted to more productive sectors such as manufacturing and services. The figures of unemployment rates in urban areas showed decline as overall

unemployment rate declined from 5.2% in 1990-2000 to 3.8% in 2011-12. However, unemployment among females turned out to be higher. Unemployment rate stood at 3.2% for urban males and 6.6% for females at all-India level for 2011-12. Tables and graphs show that majority of urban males are employed in manufacturing sector (22.3%), followed by wholesale and retail trade, repair of motor vehicles and motorcycles segment. Construction segment also employed 10.7% of urban male. In case of females, 28.7% of workforce is employed in manufacturing segment followed by education segment which absorbs 13.3% of urban female workforce. The next major employer of urban female workforce is agriculture, forestry and fishing (10.9%).

Public Expenditure on Urban Development: A hard fact is that expenditure on infrastructure and civic amenities has not kept pace with increased urbanization. Chapter 4 of the Handbook which provides an overview of public expenditure on urban development relies upon the figures of Net State Domestic Product (NSDP) at current prices and its growth for all the States and UTs from 2004-05 till 2013-14 to lend perspective to the analysis of data and to show the growth in income levels of the States. Among the major States, Maharashtra, Haryana and Tamil Nadu had a per capita NSDP of over Rs. 100,000 in 2013-14 as compared to all-India per capita NSDP of Rs. 74,380 in 2013-14. Various studies on urbanization have lamented upon the low proportion of expenditure on urban development as a proportion of the development expenditure and the total expenditure. Two tables in the Handbook cover this issue and show that at all-India level in terms of revenue expenditure, the share of urban development in development expenditure was 10.14% in 2009-10. In terms of capital expenditure, the share of urban development in total expenditure was 4.52% in 2009-2010.

Urban Transportation: Cities need high level of mobility, and provision of public transport to the desired extent has not been a success. The distribution of travel among various modes of transportation varies significantly cross Indian cities. Tables in Chapter 5 show the mode share, pattern of public transport in select cities, public transport share comparison (1994 and 2007), desirable modal shares for different city sizes, vehicular penetration in other countries, etc. Among large cities, use of public transport ranges from 15% in Ahmedabad to 57% in Kolkata. Share of motorized personal transport varies from city to city- Ahmedabad tops the list with 44%, whereas in Mumbai and Kolkata this proportion is 14% and 10% respectively. Auto-rickshaw considered to be intermediate public

transport has also a prominent share in overall transport in cities like Bengaluru (18%) and Mumbai (9%). The figures reveal that the share of public transport is very low in case of small cities with a population of 0.5 million (9%) and cities with a population of 1-2 million (13%). Share of walking and cycle is higher for smaller cities. The overall vehicle population has increased from 0.3 million in 1951 to 141.8 million in 2011. The share of two-wheelers in total vehicles has gone up from 8.8% in 1951 to 71.8% in 2011. The share of cars, jeeps and taxis has declined from 52% in 1951 to 13.6% in 2011. The share of buses in total vehicles has declined from 11.1% in 1951 to 1.1% in 2011.

Urban Sanitation: Fundamentals of public health require sanitation and drainage system in a city. Underground sewage disposal is a defining criterion of an urban area. However, urbanization has happened fast in India without commensurate progress in sanitation facilities. Chapter 6 of the Handbook covers this vital aspect and the figures show where we are lacking. Bathing facility within house was 70% in 2001, which increased to 87% in 2011 in urban India. The percentage of households having drainage facility in 2001 was 78%, which came up to 82% in 2011. There are wide inter-State disparities. Chandigarh, Maharashtra, Karnataka and Delhi are some of the States which have decent percentage of households with bathroom and drainage facility in their urban parts. Further tables show that in 2001 there were 26% households without latrine facility within the house, which came down to 18.60% in 2011. Sanitation ranking of 476 cities as per the Swachh Bharat Mission is given in a table.

Urban Housing: A common feature in big cities in India is the acute lack of affordable housing which has led to overcrowding in small houses, steady growth of slums and consequent ill effects. Cities present a picture where rich, middle-class and poor occupy the city space of varying sizes and quality. The broad information contained in the Tables in Chapter 7 is as under:

1) Total numbers of households in urban areas in 2001 were 53.7 millions which increased to 78.9 million in 2011.
2) 35.11 % households in 2001 lived in one room house, which decreased to 32.13% in 2011.
3) Percentages of households not having any separate space or those that dwell in non-exclusive room was 2.32 in 2001 which increased to 3.08in 2011.
4) One-third of population has been using two-rooms in 2010-11 and 18.38 % households in 2011 were having three room size dwellings.
5) 18% percent households in 2011

had 3 rooms dwelling, while 15.81% households had 4 room dwellings.

6) Percentage of households living in good condition dwellings increased from 64.16% in 2001 to 68.44% in 2011.
7) In 2011 69.16% households stayed in owned dwellings while 27.55 % households stayed in rented dwellings.

Directory of Urban Centres in India with population (2011). This is the first time we have a directory of Urban Areas (categorized as municipal corporations, municipal councils, nagar panchayats cantonment boards, municipal boards, and notified area committees) with latest population figures, which occupy 137 pages of the Handbook in Annexure 1.

Urban Reforms: The 74th Constitution Amendment Act was a watershed development in strengthening the urban local bodies to work as vibrant units of self-governance. Next step was to bring about urban reforms in the working of these institutions. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) (2005-2012) was launched with this aim. Central grants under the scheme were to be made available to the municipalities subject to the condition of bringing about reforms in governance and financial management. There were 7 mandatory reforms at the State level, 6 at ULB levels and 10 optional reforms. The Annexure 2 of the Handbook lists out the state-wise position of achievements with relevant summary sheets. This is a valuable documentation.

Flagship Schemes of Urban Development: Urban Sector is now receiving due attention from the Governments at the Centre and the State levels. The Government of India, Ministry of Urban Development, post 2014, launched three flagship schemes namely, Swachh Bharat Mission, Smart Cities Mission and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT). Annexure 3 of the Handbook gives concise write-ups of these schemes.

The Handbook of Urban Statistics, 2016 is definitely a valuable document for the planners, policy makers, administrators and researchers and students of urbanization. The Ministry of Urban Development has done a commendable job by bringing out this Handbook. There are many other aspects of the working and financial status of municipal bodies which need documentation. It would be very useful if the State Governments come up with such Handbook at their level, covering data of the municipalities in the States.

F. B. Khan

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OBJECTIVES

The main emphasis of the Institute's work is to see that the local bodies can contribute more effectively to the development process and provide the citizens with better living conditions by meeting their aspirations in terms of required amenities, infrastructure and better environmental conditions, thus contributing to social and economic development of the society as a whole by better management of the human settlements. While these are the long-term objectives, the immediate ones are:

- To advance knowledge of the principles and practices of Local Government by conducting research and by organising training courses and programmes at various centres in India for officials and elected representatives in the local bodies.
- To strengthen and improve Local Government Institutions by improving their performance through education, orientation and bringing them together for common endeavor by organising specialised conferences, conventions and seminars.
- To make available a platform for members of local bodies and officials for exchange of views and ideas related to urban development and administration.
- To represent the views of local authorities supported by research work to the concerned higher authorities from time to time.
- To publish bibliographies, articles, books and other literature on matters of interest to local bodies.
- To publish journals, bulletins and other literature on different aspects of Local Government and on the working of Local bodies in different states.
- To undertake research studies in public administration, problems of local bodies and also in related topics of urban and environmental factors and arrange for their publication etc.
- To establish and maintain an information-cum-documentation service for local bodies.
- To undertake consultancy assignments in various areas of urban development and problems of local bodies with a view to improve and develop organisational, managerial and operational efficiency.

In view of the above, the Institute has been collaborating with the relevant government departments, Central and State, Universities, Organisations and Research Institutions. The work of the Institute covers several aspects involving a multi-disciplinary teamwork.

All India Institute of Local Self-Government

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