ISSN 0024-5623

Local Government Quarterly

July - September 2018

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

Brought out by its
International Academy of Urban Dynamics

- Increasing Rates of Taxes and Devising New Sources of Revenue in the North Western Federation Council, Southern/ West Cameroon: A Response to the Rising Demand for Social Services
- Impact of Natural Disasters on Electoral Prospects of Contestants in the Indian Context
- Sustainable and Smart Solid Waste Management
- Empowering Marginalized Communities including SC and ST in PRIs
- A Socio-Economic Profile of Zilla Parishad Members of Maharashtra
- Assessment of Solid Waste Management of Ludhiana City: Public Health and Environmental conditions

About All India Institute of Local Self-Government (AIILSG)

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.

The Institute has been the steadfast friend, philosopher and guide to Urban Local Bodies (ULBs) across the Country. For more than eight decades it has contributed to the principles and practice of urban governance, education, research and capacity building. It has designed and developed a vast array of training literature and courses and trained more than 1.5 million stakeholders in diverse areas of urban governance and urban services delivery.

These activities of the AIILSG are practiced through 30 regional centres located in different regions of the Country. The Institute anchors the Regional Centre for Urban and Environmental Studies (RCUES) of the Ministry of Urban Development, Government of India for Western India region. This Centre is actively involved in building capabilities of municipal officials, staff and elected members from the States of Goa, Gujarat, Maharashtra, Rajasthan and the Union Territories of Diu, Daman, and Dadra & Nagar Haveli by upgrading their knowledge and skills required for effective administration and implementation of various urban development programmes.

With a view to cater to the growing requirement of ULBs in regard to services, the AIILSG runs specialized capacity building institutions such as the National Fire Academy, the Nrupur Institute of Nursing Science and Research and the Centre for Environment & Disaster Management at Vadodara, PRUDA at Ahmedabad, National Resource Centre for Urban Poverty, International Centre of EQUI-T, the Disaster Management Cell and the Centre of GIS at Pune. It runs the Solid Waste Management Cell of the Government of Maharashtra. In recent years, AIILSG has ventured into rural and tribal capacity building and hand holding of rural institutions of self-governance.

In addition to the domestic activities, the Institute organises several tailor-made capacity building programmes for various countries in South Asia, viz, Bangladesh, Nepal, Sri Lanka and in other regions, including South Africa, Ethiopia, Indonesia, Malaysia, China, etc. The Institute has linkages with renowned international organizations including UNCHS (Habitat), UNDP, UNICEF, UNFPA, WHO, DFID, CITYNET, CLGF, US-AEP and the Ford Foundation. It is the anchor institution for Urban Management Programme (UMP-UNCHS-Habitat) for South Asia.

About International Academy of Urban Dynamics (IAUD)

International Academy of Urban Dynamics (IAUD) has been conceptualized and set up at the AIILSG with a view to support countries and cities and their stakeholders in their decisions towards a bright urban future.

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 : LXXXVIII, No. 3 July - September, 2018

Contents

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

All India Institute of Local Self-Government
M. N. Roy Human Development Campus, Plot No.6, 'F' Block,
TPS Road No.12, Bandra (E), Mumbai – 400051.
Tel : +91-22-2657 17 13 / 2657 17 14 / 6180 56 00 Fax : +91-22-2657 21 15
E-mail : dg@aiilsg.org Website : www.aiilsg.org

Local Government Quarterly

Printed by Rajiv Agarwal (I.A.S. Retd.), 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

Disaster Risk Reduction; Build Back Better

The heartrending accounts of the Tsunami which hit Indonesia, mainly the Sulawasi Island and Palu Town recently, have once again brought to the fore the colossal human tragedy unleashed by nature during such catastrophes. The disaster has reportedly claimed about 840 lives so far with thousands likely trapped in debris and widespread loss of property. In India, the Kerala floods earlier this year reportedly claimed over 300 lives and left lakhs of people homeless and stranded. The monetary losses, as per some estimates, run into several billion dollars. These events underscore once again the extreme vulnerability of communities to disasters. Similar events occurring repeatedly in different parts of the globe highlight the fact while much has been achieved, a great deal remains undone. The efforts at the global level are wide, deep and call for rigorous engagement with governments, civil society and local communities.

The United Nations Office for Disaster Risk Reduction observes October 13 each year as International Day for Disaster Reduction. This office was established to ensure the implementation of the United Nations International Strategy for Disaster Reduction (UNISDR). The observance of this day works to engage the international community of governments, civil society and other stakeholders to bring about lasting success in our fight against the huge losses - human, economic and social – that disasters bring about. The theme for this year's observance is Target C of the 7 targets of the Sendai Framework, namely, *Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.* The Sendai Framework for Disaster Risk Reduction 2015–2030 was adopted at the United Nations World Conference on Disaster Risk Reduction, held in Sendai, Japan between 14 & 18 March 2015.

Disasters can leave very deep scars on the psyche of the individual and the community. The poor, the aged, the children are particularly vulnerable due to loss of precious livelihoods which can put them back by several years or even decades. The rebuilding of lives can be prolonged, painful and arduous even in the best of conditions. It can become very challenging in difficult terrain and in fragile socio-economic situations.

Recognizing the crucial aspect of building resilience into the entire approach to Disaster Risk Reduction, the Sendai Framework articulated the following priorities:

Priority 1 : Understanding disaster risk.

Priority 2 : Strengthening disaster risk governance to manage disaster risk.

Priority 3 : Investing in disaster risk reduction for resilience.

Priority 4 : Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

AIILSG and DRR

For AIILSG, work on Disaster Risk Reduction (DRR) is an important pillar of its initiatives especially those with the urban, rural, tribal and vulnerable sections of society. A number of projects undertaken by it have received wide attention and acclaim. Among the notable ones is the Global 2015 RISK Award bestowed upon AIILSG by UNISDR, Munich Re Foundation and Global Risk Forum, Davos for its Self-Assessment and Planning (SAP) project. The Project received significant funding as well. The Pilot implemented in 77 settlements of vulnerable populations worked to integrate the people most at risk, namely the poor, especially women and children by leveraging traditional knowledge and techniques of the communities. The initiative helps people assess their own situation with respect to disaster risks and hazards. Then some volunteers including women are equipped as trainers and take the process forward across the community. Children are considered very important stakeholders in the whole process in part because of their greater vulnerability during disasters and also their ability to learn quickly. Most importantly they will serve as the agents of change in the future. Child friendly IEC tools such as street plays, puppet shows, pictorial messages and mock drills helped

engage them actively. A beneficiary slum dweller said, “We are not fully aware about disaster risks and their mitigation and preparedness. This project will be very crucial as it will build our capacities and community resilience”. The architecture of the project is scalable and global and can thus be implemented everywhere. AIILSG has also worked extensively on DRR among Denotified Nomadic Tribes (DNTs). These populations though large in number live in extreme deprivation often without access to clean water, sanitation, electricity and housing, at the fringes of villages; they are caught in a vicious cycle of illiteracy, poverty, discrimination and exclusion. And therefore their extreme vulnerability during disasters. AIILSG has undertaken the world's first DRR program for nomadic tribes and has been grooming a cadre of DRR Trainers from among the nomadic tribes' women.

As we encounter rapid and relentless urbanisation in all parts of the world, there could be greater incidence of disasters caused by the pressures of urbanisation including urban sprawl, encroachments and densification of settlements. Alongside, the world is seeing the outcome of the climate change phenomenon, caused in part by growing vehicular emissions, contamination of natural resources such as water and overall environmental degradation. These could cause greater incidence of disasters such as landslides, droughts and floods. While all stakeholders have key roles in foreseeing, preventing and mitigating the effects of these events, local communities need to take charge of measures at the micro level through greater awareness and a culture of prevention in order to protect themselves.

Shinzo Abe, Prime Minister of Japan puts it succinctly “As a country with experience of coping with earthquakes, tsunamis and other natural disasters, Japan believes in emphasizing the mainstreaming of disaster risk reduction. We therefore prioritize investment in disaster prevention and post-disaster improvements under a policy of Build Back Better (BBB).”

Increasing Rates of Taxes and Devising New Sources of Revenue in the North Western Federation Council, Southern/West Cameroon: A Response to the Rising Demand for Social Services

Protus Mbeum Tem

Introduction:

Fiscal devolution with regard to expenditures is one of the methods used in addressing the insufficient delivery of services in most economies in the world in general and low income countries in particular (World Bank, 2004; Besely and Chatak, 2006). Hence, the delegation of authority in the provision of social services falls within the sphere and influence of local governments (Nwoba, May 2015). The provision of these services enhances the welfare of citizens individually and collectively and is intended for the boosting of cohesion within a community. As opined by Torjman, and Leviten-Reid (2003) local governments play important roles in the provision of social services with regard to basic needs such as affordable housing, food and other essentials like food transportation among others. To them, the welfare of their populations is their principal preoccupation. Again, they hold that it is the responsibility of local governments to support the economic development (skills, child development and inclusion) of their municipalities. The United Nations (2000) also posits that these institutions also have a duty to support elderly, provide food and nutrition, education, water and sanitation and be responsive to disasters and crises that affect their people.

Though local governments are responsible for the provision of services at the local level as aforementioned, they have been given less fiscal autonomy by the central authorities. This is especially true in developing countries where fiscal decentralisation has not been embraced fully by central governments. They (central authorities) have remained dominant in the institution or determination of sources of revenue and collection with the intention of transferring part of it to Local Governments. However, this is

usually done piecemeal. This approach has made it impossible for these institutions to effectively and satisfactorily provide social services to their people. It is because of this setback that the paper revisits the situation in the North Western Federation Council of Wum Division of Southern (West) Cameroon where these institutions enjoyed self-government in the management of local affairs in general and fiscal autonomy in particular. This was eminent especially in the institution of sources and collection of revenue in order to meet the demands for services by their constituents.

This study has been enthused by the fact that, after the unification of Cameroon in 1972, the local government system became centralised and the financial autonomy hither enjoyed by these institutions dwindled. Besides this, the freedom to legislate and institute new sources of revenue became invisible. Local Governments now depended so much on the central authorities for finances and this greatly affected their activities resulting in the poor delivery of services when compared to their achievements earlier.

The British annexation of the territory after World War I initiated the introduction of its Indirect Rule policy whereby power was devolved to Native Authorities that were created in the territory. These institutions became the lowest tier of government in the colonial administrative organisation of Southern Cameroons and were granted some autonomy in the collection of revenue and the provision of services to their people initially. Though vested with these powers, authority was limited by the role played by the District Officers in the colonial administration. They could quash any decision that was at variance with colonial policy. In spite of this setback, the end of World War II brought new momentum to the activities of these organisations as they were federated into larger administrative units, which the British Authorities styled Local Governments, and granted more authority in the management of finance resources and the provision of services to their people. In this direction, the Kom, Fungom, Aghem, Bum and Beba–Befang Native Authorities were federated into the North Western Federation Council with an autonomous treasury.

The introduction of Local Government treasuries by the British colonial authorities in 1948 after the creation of these institutions increased the powers hitherto enjoyed by local authorities. They were given the responsibilities of raising revenue and using them in the provision of services to their communities. Though given this authority, they collaborated with the Divisional Officers who consulted

and advised them on behalf of the central government (Lf/a (1949)1. No. B. 725, National Archives Buea, NAB). In spite of the pivotal roles played by these administrative officials in Local Governments affairs, these institutions could institute new sources of revenue or increase existing rates whenever the need arose or when demands for services mounted with little interference from the central authorities.

Money raised by these authorities mostly came from taxation which was the principal source of revenue. In this connection, a number of sources were instituted and included; poll tax, jangali, fines and fees. Revenue was also raised from forestry products as licences had to be obtained before operating in the area. Revenue was also raised from veterinary products, rents and hire of property by individuals or groups from Councils. Council farms and nurseries also provided revenue as products from these establishments were sold to the public. Besides, government grants came to the relief of Local Governments. Most of these finances were used in the provision of educational facilities and services amongst which were infrastructure, didactic materials and the recruitment and payment of staff as well as scholarship opportunities for their inhabitants to study at higher educational institutions that were not found in the area. This was also extended to the health and sanitation sector where infrastructure, affordable drugs and personnel was provided by these institutions. Furthermore, Local Governments delved into the justice sector and not only took responsibility for the payment of staff and judges but also provided buildings that housed the Law Courts and relevant materials needed. Another area of interest was the cultural heritage of their communities as revenue raised also went a long way to promote and preserve the cultural heritage of their communities.

From the above mentioned sources of revenue, it is clear that no stone was left unturned by Local Governments in the pursuit for revenue as all sectors of the economy, which could contribute financially to their endeavours, were not ignored or unexploited no matter how small it could contribute. It is believe that if Local Governments around the World can revisit the activities of the North Western Federation Council and emulate the vigour put in by these institutions in raising revenue, they can adequately raise funds and satisfactorily provide for the social needs of their communities. This is equally true for the central governments of developing countries in general and Cameroon in particular for if they can be inspired by the example of the British Colonial Authorities and the Government of West Cameroon by devolving fiscal

autonomy to these institutions without any strings attached, their performance in the delivery of social services will be improved upon greatly.

Demand for Social Services and the Quest for Finances in the Local Government Area

Increase in demand for educational services became the greatest catalyst for the institution and collection of poll tax by these institutions. Before 1948, very few schools were found in the area. There were the Roman Catholic Schools of Njinikom, Mekaf and Fungom, the Native Authority schools in Njinikom, Bu and Befang, and the Basel Mission school at Weh (Ja/g (1929)8. No. 192/29, NAB; Vires, 1998). After 1948, the number of schools in the area increased as the Local Governments opened up some at Mejang, Fundong and Fujua (for the Fulani). Missionaries also moved in a similar direction and opened up more schools. It was the responsibility of Local Government to provide the needs of these learning institutions as they not only took care of their own schools but also aided those of the missions by providing infrastructure, paying staff and providing didactic materials (Sb(1951)1. No. V. 1680, NAB; Ad(1922)24. No.772/22, NAB). When necessary, scholarships for higher institutions of learning were offered to their people and between 1964 and 1970 about 24 students had benefited (Ja/g(1964)6. No. CI. 553, NAB; Ja/g(1968)4. No. CI. 551, NAB; (Ja/g(1968)6. No. CI. 551, NAB; (Ja/g(1968)5. No. CI533, NAB). To take care of these demands, education rates were instituted in 1952 and these were paid alongside poll tax by all taxable male citizens of that jurisdiction (Ja/g(1950)1. No. 106, NAB).

Added to education services, local governments also provided health facilities to its communities. Before the creation of the North Western Federation Council, only the Basel Mission Health Post of Weh, the Catholic Hospital at Njinikom and the Cameroon Baptist Hospital of Mbingo were the major health services providers in the area. Because of the inability of these institutions to effectively offer services and meet the demands of the people, the Council decided to construct these institutions and in 1949, the Njinikom Dispensary had been built. This was followed by two others in Wum and Befang in 1955. A Maternity home was also built in Wum in 1950 (E(1949)2. No. 23230A, Vol. I, NAB). Other health institutions were opened at Bum, Fundong, Mbam, su – Bum, Befang, Esu and Abar between 1964 and 1969. (Ci(1957)3. No. 195, NAB; Ja/g(1964)5, NAB; Ja/g(1968)1. No. CI. 5554, NAB; Ja/g(1966)8, NAB; Ja/g(1965)5. No. CI. 553, NAB). The North Western Federation Council did not only

provide facilities but also recruited and paid staff, supplied drugs and carried out vaccination campaigns whenever epidemics would break out or were threatened in the area. Added to these, sanitation facilities were also made available and awareness campaigns on hygiene and sanitation carried out.

Besides, they managed the justice sector (Native (Customary) Courts) of their communities. Judges and staff of these courts were paid by them. Additionally, they provided infrastructures that housed these courts and staff. In this direction, court houses were constructed in all villages that hosted these institutions and these were found in Zhoa, Abar, Kom, Bum, Modele, Esimbi and Wum. They not only took care of the Customary Courts but also carried the financial responsibilities of the Western and Eastern Courts of Appeals that were found in the Division. Table I shows the amount spent by these institutions as sitting fee per month in the various courts of the Division between 1955 and 1960.

Table I: Monthly Sitting Fees Paid to Court Members of the North Western Federation Council Area in Pound Sterling, 1955 – 1960

Court	Sitting Fees Paid
Aghem	£8:7s
Beba –Befang/Esimbi	£12:3s
Bum	£3
Fungom	£51:3s 6d
Kom	£7:3s 6d

Source: Ma/a(1956)1. No. 3210/S.1. Remuneration of Native Court Members, 140, NAB.

It should be noted that though these institutions raised revenue through court fines and fees, the amount spent on the remuneration of judges and the payment of staff was higher than the amount raised from these sources. This can be justified by Table II which presents income derived from court finds and fees and expenditures on court members and staff between 1968 and 1969.

Table II: Income and Expenditures on Court Members and Staff of the Councils in Wum Division in Francs CFA, 1968 – 69

Customary Court	Fees Derived from Fines and Inspections	Expenditures on Court Members and Staff	Excess Revenue over Expenditure	Excess Expenditure over Revenue
Aghem	360,000	557,550		197,550
Modele	247,000	559,700		310,450
Zhoa	586,035	745,676		159,641
Kom	485,090	950,560		473,410
Bum	162,250	803,500		641,250
Esimbi	100,500	509,310		408,810
Abar	171,700	40,500	131,200	-
Wum Eastern and Western Courts of Appeal	156,000	428,500		272,500
Total	**2,268,825**	**4,603,236**	**131,200**	**2,465,611**

Source: Ma/a(1968)1. No. C2. 1116 Vol. I, 1968/69. 70/71 Customary Court Statistics, 1970, 8, NAB.

As depicted on table II, these courts were a liability to the finances of the Councils. Only 2,268,825 francs came in from these courts as revenue but 4,603,236 francs was spent on the thirty five court members and twenty nine staff in the nine courts of the area. Apart from the Abar Court that had a surplus of 131,200 francs, 2,334,411 had to be pumped into the courts from other sources of revenue.

Another area of interest was the preservation of the cultural heritage of their people as the Council sponsored cultural activities and organised events where people showcased their cultures (Ja/g (1964)1. No. 554, NAB). This was during national events like the Empire Day celebrations that were sponsored by Local Governments. They also made sure the culture of their people was displayed during Agricultural Shows and Divisional festivities of Arts and Culture which were annually organised. During such occasions, Local Governments provided food, transport and prizes for the best performing groups (Qc/b(1955)2. No. NR 217/Vol. I, NAB). These institutions remained the main financing body. For instance, 143,300 francs was spent by the Kom Bum Council in the 1966 District Cultural Festival. In 1967, the amount budgeted for the event increased to

200,000 francs. Further increases were witnessed in 1969 as 237,190 francs was spent during that event (Ja/g(1964)1. No. 554, NAB).

Direct Taxes and Increasing Rates

Poll Tax was the major source of Local Government finances. Every male adult contributed to the development of their Local Government area through the payment of this tax. Different clans in the areas were charged different rates. For instance, in 1947/1948 finance year, in the Kom clan area, nine shillings were paid as poll tax by every taxable male. The case was different in the Fungom area where five shillings were charged. In the year 1948/1949 it was raised by one shilling and Kom and Fungom clans now paid ten and six shillings respectively. Discrepancies in payments can also be justified with the rates charged in Beba - Befang, Wum and Bum. Five shillings were charged in these areas and in Esimbi clan, four shillings was the amount paid. By 1950, the rates paid in the Beba - Befang, Wum and Bum rose by one shilling. This was equally true for Esimbi. It therefore means that by 1950, Beba - Befang, Wum and Bum were charged six shillings and Esimbi, five shillings per tax payer (Cb(1948). No. 3241. NAB). No justifications could be advanced by the colonial authorities as no convincing formula was used in designating these amounts to the different Native Authorities. Vaguely, they stated or argued that this was based on the paying abilities of the communities.

With the creation of the North Western Federation Council in 1948, moves were made in harmonising these rates and eight shillings were charged for every tax payer by 1952. The fifteen percent increase in the salary of Council staff in the Local Government area and the need for more finances to meet the demand for social services necessitated another increase. As a result of this, poll tax rate was raised by two shilling six pence. This increase needed the approval of the Governor of the Eastern Region of Nigeria which came in 1954. Hence, by 1954, the new rate stood at ten shillings six pence (Lf/g(1954)1. No. B. 1559, NAB; Lf/g(1950)1. No. 106, NAB). Changes in the economic activities of the people and increased demand of good and services and better still, increase in the standards of living and consequently social services led to further increase in poll tax. This was raised to twenty shillings two years later (Ci(1955)1, NAB).

Similar reasons accounted for another increase in 1960 as poll tax was raised to one pound seven shillings. This increase was further facilitated by a rise in the salaries of Local Government staff by twenty percent. There was therefore the need to source

funding in order to handle these increases and the rates were again raised to one pound fourteen shillings in 1962 (Sb/a(1959)10. No. LG. 1970. NAB; Ja/g(1957)1. No. WDA/1A Vol.4, NAB). This was augmented to 1180 francs (about one pound fifteen shillings) (Sb/a(1959)10. No. LG. 1970, NAB) by 1965. The rates continued increasing along the years and in 1968, it stood at 1200 francs and by 1970 it had risen to 1800 francs (Ja/g(1968)5. No. CI. 553, NAB). The increasing rates of poll tax has been summarised on Table III.

Table III: Poll tax Increments, 1952 - 1970

Year	Increments	Amounts
1952	-	8s
1954	2s 6d	10s 6d
1956	10s 6d	22s
1960		£1:7s
1962	7s	£1:14s
1964	1s	£1:15s (1180frs)
1968	20frs	1200frs
1970	600frs	1800frs

Source: Compiled by Author with Knowledge from Archival Materials, NAB.

Jangali was another source of revenue and was next to poll tax in terms of revenue. This was paid by grazers or cattle owners to Local Governments in areas where their cattle grazed. By 1948, two shillings were paid per cattle annually. By 1949, it was raised to three shillings (Ja/g(1949)1, NAB; Gc/b(1955)1. No. LG 1845, NAB). Just like in the case of poll tax, as aforementioned, the 1952 increase in the salaries of staff not only affected poll tax but also Jangali rates. It was in this context that the rates were raised to four shillings in 1953. The need for more funds necessitated another increase and it was raised to eight and ten shillings in 1955 and 1956 respectively. This remained in force until 1965 when two hundred and sixty francs became the new rate (Kc/e(1960)1. No. F 241, NAB; Ci(1955)1, NAB). The various increases between 1952 and 1972 are summarised on table IV.

Table IV: Jangali Tax Increments, 1952 - 1970

Year	Increments	Amounts
1948	-	2s
1949	1s	3s
1953	1s	4s
1955	4s	8s
1956	2s	10
1965		250frs

Source: Compiled by Author with Knowledge from Archival Materials, NAB.

Indirect Taxes and Increasing Rates

Court fees and fines also contributed enormously to the revenue of local authorities. In the 1949/1950 finance year, one thousand one hundred and three pounds were collected from Court fees (Lf/a(1949)1. B. 725, NAB; Ci(19561a, NAB). In the 1950/51 year, two hundred and thirty six ponds were also collected. In order to increase revenue and meet the increasing expenses, the issuance of licenses and permits were introduced as sources of finance by Local Government. The bicycle and dog license stands out conspicuous. Though the dog license was introduced by legislation in 1956, it could not go operational as a lot of sensitisation was needed. The authorities had to wait for two years before engaging in its collection. However, the amount raised was minimal as people resisted paying. The Council could not relent in its efforts especially when more money was needed to meet the demands for social services and due to a lot of propaganda, the situation was reversed and by 1965, five hundred and sixty francs was collected per dog. The actual amount per permit was three hundred francs but two hundred and sixty francs was added to it as vaccination fee. This was because dogs that were licensed also had to be vaccinated against diseases. Hence, the vaccination fee was added to the permit fee and jointly collected. The bicycle license was three hundred francs per bicycle (Ja/g(1968)5. No. CI. 553, NAB; Ja/b(1965)3, NAB).

Liquor licenses were also introduced. Two thousand francs was paid for an on – license and one thousand francs for an off – license. To further raise revenue, a transferable fee from one person to another was instituted and two hundred francs was collected per transfer made (Ja/g(1964)6. No. CI. 553, NAB) Money was also raised from the sale of native liquor as those engaged in the

business were charged two hundred francs before a license could be accorded them (Qb/c(1966)1. No. CI 1019, NAB). Only those in possession of licenses could operate restaurants. To acquire this, any single room that was used in the operation (as an eating house) was levied one hundred francs annually. This also extended to other facilities used in the preparation of food. Furthermore, an Engine Driven Corn Mill operator also had to procure a license worth one thousand francs annually before he or she could operate. Hand Driven Mill operators were not exempted from taxation as they paid four hundred francs per mill annually. All these sources and amounts were visible in the Kom – Bum area by 1969 (Ibid).

In the Wum Central Council area, these were also introduced and charges differed from those instituted by the Kom – Bum Council. These were limited to certain areas that were deemed advanced in the Local Government area. Here, Esu, Bafang, Aghem, Weh, Mmen and Esimbi Markets were single out. A restaurant that operated on a single room was charged seven hundred francs annually. Hand and engine operated corn mills were charged three hundred and fifty and seven hundred francs respectively. Bakeries too needed licenses to operate and these were charged according to categories. A big bakery was charged one thousand five hundred francs per permit. Where business men came in to renew their licenses late, a fee of two hundred francs was collected as fine (Ja/b(1965)3, NAB).

Hawkers operating in the Local Government area also acquired licenses before they could operate and through this means, much money was raised. This was adopted by the Wum Central Council in 1965 and four hundred francs was paid for a single license. This was applicable in the Wum, Weh and Befang three corners and the Esu Market Square and Mme Hausa Quarters. By 1970, it had risen to one thousand francs per permit. By 1969, this had extended to the Kom – Bum Councils area and seven hundred francs per license was charged (Qb/c(1966)1. No. CI 1019, NAB; Ja/g(1968)5. CI 553, NAB). The Vehicle license was also introduced in 1969 in the Wum Central Council and four hundred francs was collected per license annually. Building permits that were issued by these institutions also attracted money into the Local Government coffers. Before construction could be carried out, Building licenses had to be obtained and the amount charged was relevant to the cost of the structure (Ja/g(1968)5. CI 553, NAB). Grazing licenses were instituted and any grazer needed to acquire one before he could graze his cattle in the area.

Fees and rents were also charged for Local Government property and services provided. Staff quarters were constructed and they became an excellent and constant source of revenue to these institutions. For instance, the Local Government residential quarters or former Dispensary that was occupied by the Nigerian Police in 1960 in Njinikom, fetched the Local Government sixty pounds as rents in 1960 (Lf/a(1960)1. LGP 532/S.7, NAB). This was equally true for the Maternity Staff quarter that was occupied by the Gendarmerie in Wum after independence. Other structures like Local Government halls also brought revenue. A case in point was the Aghem Community Hall that was built and completed by the Wum Central Council in 1969. It was hired out to individuals or groups for ceremonies. In this connection, two thousand francs was paid or charged for a ball room dance and one thousand for marriage ceremonies. This was raised to three thousand five hundred and two thousand five hundred francs for the same purposes respectively. The increase came as a result of the acquisition of a generator and the electrification of the hall in 1970 (Ibid; Ja/g(1968)4. CI 551, NAB). The Njinikom Hall was also hired out for similar events by the Kom – Bum Council on hourly bases and a hundred and fifty francs was charged for an hour usage (Ja/g(1968)1. No. CI 5554, NAB). Local Government vehicles or trucks were hired to private users and the Department of Public Works and income raised. This can be justified by the three hundred and two pounds that were raised between April and January of 1961 by the Kom – Bum Council (Lf/a(1960)1. LGP 532/S.7, NAB).

Added to this, though Local Government dispensaries and maternities were set up to serve the people and alleviate them of their health problems, some charges (fees) though minimal, contributed to the income of these institutions. In 1955, dispensary fees were introduced and three shillings were charged for any attendance or service provided to an individual. In 1960, it was raised to six shillings. Injections that were formerly done for free before 1955 drew two shillings six pence per exercise from an adult patient. By 1962, two hundred francs was charged in the Wum Central Council Area (Ibid; Ja/g(1966)8, NAB). In the Kom Bum Area, adult and children injections raised one hundred and twenty five francs respectively. Dispensary cards were also sold for twenty francs from 1969 in the dispensaries of the Wum Central Council (Ja/g(1968)4. No. CI 551, NAB). The situation was similar in the Kom – Bum area where ante natal cards were issued at twenty five francs and children welfare services was billed at ten francs. Furthermore, women who delivered in these institutions were charged five hundred

francs and those that did so at home before being attended to at the ante natal clinic paid fifty francs. These amounts took care of treatments within the ante natal period. Circumcision that were carried out in these units received two hundred per child (Ja/g(1968)1. No. CI 5554, NAB). Just like the case of the Kom – Bum area, the Wum Central Council, introduced dispensary fees and it stood at one hundred francs but injections were free for adults and children (Ja/g(1968)5. CI 553, NAB).

Market fees also became a veritable source of revenue as these were charged on traders who occupied and made use of these structures established and constructed by Councils. These were introduced in 1965 and the aim was to facilitate trade and commercial activities in the area. In the Kom Bum area, temporary stalls that were open sheds were charged one thousand two hundred francs and lock-up or permanent ones were charged one thousand five hundred francs. Charges for plots that did not harbour council structures in the market and occupied by traders ranged between two hundred and fifty to six hundred francs annually. Depending on the size of the area occupied, three hundred, four hundred and fifty and six hundred and fifty francs were the official rates. In 1969, the rates were increased and some occupied areas could draw as much as nine hundred and one thousand two hundred francs annually. Transferring any stall from one owner to the other attracted a fee of one hundred francs before the operation could take place. Mobile traders or those who moved up and down the market without any permanent site paid ten francs daily (Qb/c(1966)1. No. CI 1019, NAB). This was equally true for the Wum Central Council area where fees and rates were also collected from markets that were built by this Local Government. By 1968, an open or temporary stall was given out to traders for the sum of one thousand francs and permanent stalls were offered to traders at the sum of one thousand five hundred francs monthly. Occasionally, some traders were offered stalls on temporary basis and they paid fifty francs per day. Just like the Kom Bum area, transferable fee for a stall was one hundred francs and fees for mobile traders stood at ten francs per day (Ja/g(1968)4. No. CI 551, NAB).

Special markets for the purchase and sale of cattle were also created in the area and became a dependable source of income. In relation to these markets, fifty francs was collected per cow brought to the Wum cattle market for sale as of 1968 (Ja/g(1968)4. No. CI 551, NAB). This market was also visible in Fujua and two hundred was charged per cow as cattle trade fee. In a similar vein, One hundred francs was charged for a horse and fifty francs for

any other animal that was brought to the market (Ja/g(1968)5. No. CI 553, NAB). Added to these, cattle brought in further revenue when they were slaughtered. Each cow slaughtered for consumption was charged a hundred francs and others fifty francs each. These rates were introduced in 1957 (Ja/g(1957)1. No. WD/1A/VOL. 4, NAB). In 1963, the North Western Federation Council decided to formalise this activity and Slaughter Adoptive Rules were passed and applied in the villages of Weh, Njinikom, Aghem, Befang, Belo, Mme and Fundong. This time around a butcher paid three hundred francs per cattle slaughtered. One hundred and fifty francs came into the coffers of the Local Government when a goat or sheep was slaughtered, respectively (West Cameroon Gazette Complement, 1963, NAB). These amounts were increased in 1967 and in the Kom – Bum area, five hundred francs was charged for a cow, two hundred per pig, seventy francs for sheep and goat and fifty francs for any other animal slaughtered (Qb/c(1966)1. No. CI 1019, NAB). These increases were also witnessed in the Wum Central Council area. In 1969, a cow which was slaughtered saw the Council receiving seven hundred francs. Goats, sheep and pigs extracted two hundred francs from butchers and other animals one hundred francs (Ja/g(1968)5. No. CI 553, NAB). Slaughter slabs had been constructed by these institutions and all animals had to be slaughtered here and not in private residences. With this, it was easy for this activity to be monitored by officials.

These animals, though important, were not allowed to stray around carelessly and were impounded when caught by Local Government officials. Their release to the owners could only be done when a fine was paid into the Treasury. Between 1949 and 1955, five pounds was paid for any impounded cow. In 1955, this was raised to twenty five pounds (Ja/g(1959)2, NAB). Further increases came in 1963 as the amounts increased and three hundred and fifty francs was paid for a cow per day/night spent. Meanwhile pigs, goats and fowls were charged fifty, thirty and ten francs respectively (Ja/g(1966)8, NAB; (Ja/g(1968)5. No. CI 553, NAB). The imposition of these fines was not only to raise revenue but also to protect farms from being destroyed by stray animals. This was to promote agricultural productivity in the area.

In this direction, Council farms and nurseries were raised and brought in much needed income. Seeds were bought from these farms by the people of the area. For instance, the coffee nursery farm at Weh and Kom sold out six thousand and fifteen thousand seedlings to farmers in 1957 and 1958 respectively. Eucalyptus and cypress seedlings were also money making

produce for the Local Government. Coconuts, oranges, mangoes, oil palms, rice, yams and pineapples were all supplied from these nurseries and farms and money raised. Vegetable gardens were also established and produce from these establishments contributed their own quota to the finances of these institutions. Vegetables from these farms were supplied to the people especially during the dry season when they were scarce in the area. Poultry farms were also developed by the Kom – Bum Council and by 1970 it had raised two hundred and thirty five thousand three hundred and ninety five francs for that year (Ja/g(1966)8, NAB).

Water rates were also instituted and collected by Local Governments. By 1962, one shilling was charged monthly by those living 400 radius to the water points that were constructed by these institutions. One hundred and eighty three pounds or one hundred and twenty six thousand three hundred and forty francs was collected in 1962 (Ja/g(1957)1. No. WD/1A/VOL. 4, NAB). It was raised to four hundred and sixty francs for every taxable male after 1962. The establishment of motor parks in Weh, Esu, Aghem and Befang saw one hundred francs collected from any commercial vehicle and fifty francs from private users that parked in any of them. This was a daily rate. Besides, the Wum Central Council procured canoes that were used in fishing on the Wum Lake and River Katsina and the fishermen that were employed by this institution had to pay in proceeds from their activities.

Furthermore, revenue was also raised from the forestry potentials of the Local Government areas. This came from forest exploiters as licenses were offered to them before they could operate. The Kom – Wum Local Government reserve was a veritable source of income as timber exploiters paid some money to the institution. Besides, the Public Works Department that also exploited this forest for public works regularly paid some money into the coffers of Local Government. In 1953, timber from this forest accounted for fifty seven pounds in the 1953/1954 finance year (Ci(1950)1, No. 106, NAB). In 1955, the Department of Public Works also deposited twenty one pounds fifteen shillings into the Local Government Treasury (Ci(1955)1, NAB). Plantations that were raised by the North Western Federation Council as early as 1949 became a source of finance. These fuel plantations were raised in Wum in 1949 and extended to Mme and Fundong in 1964. Wood from these plantations became an excellent source of energy and provided timber for building and construction material to the inhabitants of the Local Government area as people trooped to these plantations for demand. This also attracted people from out of the area.

Conclusion

The study discussed the fiscal responses of Local Government(s) to the rising demand of social services in the North Western Federation Council area through the raising of taxation rates and introduction of new sources of revenue. It contends that revenue mostly came from poll tax, jangali, fines and fees which were the principal/traditional sources of revenue before 1948. These sources remained the primary sources of income between 1948 and 1972. Poll tax was charged on every male adult that resided in the Council area and differed from clan to clan and by 1952, the rates had been harmonised and eight shillings were charged for every tax payer. By 1954, it had risen to ten shilling six pence and two years later the new rate stood at twenty shillings. The increase in the demand for services led to another increase in 1960 and every taxable male was charged one pound seven shillings and in 1962, one pound fourteen shillings became the new rate. Further increases were witnessed in 1965, 1968 and 1970 as 1180 francs (about one pound fifteen shillings), 1200 francs and 1800 francs were paid respectively. These increases were also witnessed with the Jangali that was paid by grazers or cattle owners. By 1948, two shillings were paid per cattle annually and a year later it had risen to three shillings. Increases in the rates were again witnessed in 1953, 1955 and 1956 and 1965 as four, eight and ten shillings and two hundred and sixty francs became the new rates respectively.

Other indirect sources of revenue that contributed enormously to revenue were court fees and fines that came from the law courts. New sources of revenue introduced were licenses and included the bicycle license, dog license, liquor license, restaurant license, Engine Driven Corn Mill license and Hand Driven Mill license. Bakery, Hawkers', Vehicle, Building and Grazing licenses were instituted. Rents from Local Governments property was another source of revenue. Funds were also raised from health services provided by Local Government institutions; dispensary attendance, injections, dispensary card, ante natal card and delivery fees. This was equally true for education rates that were paid alongside poll tax. Market fees and charges, slaughter fee paid by butchers, impounding fees paid by the owners of animals impounded by Council officials were also veritable sources of revenue. Council farms and nurseries were also used in raising revenue through the sale of seeds and vegetables. Poultry farms were developed and products from these farms were sold to the public and in this way, the much needed revenue was raised. Water rates were also instituted and collected by Local Government on water facilities that were constructed

by them. Motor parks fee that was paid by commercial vehicle owners for using motor parks was instituted by the Councils were also collected. The involvement of the Wum Central Council in fishing on Wum Lake and River Katsina brought in proceeds from the sale of fish.

The introduction of these new sources of revenue and the raising of existing rates was necessitated by the need to meet the increased demand for educational services and facilitates. The most demanding sector was education as facilities and services were needed to meet the ever increasing schooling population of the area. In this direction, infrastructure, didactic materials and the recruitment payment of personnel as well as the provision of scholarships for their inhabitants to higher educational institutions of learning that were not found in the area became the greatest catalyst. This zeal to provide for the health and sanitation needs of their people necessitated the search for increased sources of funding to meet the ever increasing infrastructure, affordable drugs and personnel. The need for more court houses, staff and judges and relevant materials cannot be overemphasized as well as the need for the preservation and promotion of the cultural heritage of their communities. All these initiated Local Government endeavours in the search for more sources of revenue. The study concludes that if Local Governments can follow the example of the North West Federation Council and exploit every available source of revenue, no matter how small or insignificant the amount may be, they will adequately raise funds and satisfactorily provide for the social needs of their communities. It also opines that if the governments of developing countries in general and Cameroon in particular can take inspiration from the British Colonial Authorities and empower Local Governments fiscally, to legislate, institute and collect revenue without interference, their performance in the delivery of social services will be enhanced.

Endnotes

[i]This area is present day Menchum and Boyo Divisions of Cameroon. This was constituted into a Local Government area in 1948 and in 1949; it became a Division in British Southern Cameroons. Upon independence, it maintained this status until 1964 when the Kom – Bum Council was carved out and made a Local Government of its own. The other part of the Division was rebaptised, Wum Central Council. Furthermore, in 1968, the name of the Division was changed and Wum Division was renamed Menchum Division and in 1992, the Kom – Bum Council Area was upgraded into a Division and given the appellation, Boyo.

[ii]The Territory was part of German Kamerun that was overrun by the French and the British forces during World War I. After a failed condominium, the victorious allies divided the territory into two, British and French Cameroons. Because of communication difficulties, the British further divided their territory into two parts, Northern and Southern Cameroons, for easy administrative purposes. The Northern part, styled Northern Cameroons, was attached to the Northern Region of Nigeria and administered as part of that administrative unit and the Southern part, where the area of study is found, was named Southern Cameroons and administered as part of Eastern Region of Nigeria. In 1954, the territory gained semi autonomy or quasi regional status from the British Protectorate of Nigeria and upon independence, in 1961, it reunified with French Cameroon that had gained independence in 1960 and the Cameroon Federation was born. Southern Cameroon became the state of West Cameroon and French Cameroon, East Cameroon.

[iii]See Protus Mbeum Tem (2016). Flaws in the Native Administration System in Southern Cameroons: A Factor for the 1949 Creation of Local Government Units, Afro Asian Journal of Social Sciences. Volume VII, No I, Quarter I, pp. 1 – 24 for the British Policy of Indirect Rule and its implementation as well as Reasons for creation of Local Governments in Southern Cameroons in 1948. See also Protus Mbeum Tem (2016). Proliferation of Native Courts in Wum District, Southern Cameroons, 1921-1939. Lagos Historical Review, Vol. 15, pp.59 – 76 for the creation and evolution of native authority units in the area of study before the outbreak of World War II.

References

1. Ad(1922)24. No.772/22. Wum Assessment, Bamenda Division, 1922 – 1932, NAB.
2. Cb(1948). No. 3241. Annual Report, 1958, Bamenda Division, NAB.
3. Ci(1950)1. No. 106. Annual Reports (Report of 1952) Enclosed. Also 1950, 1951, 1953 and 1954, NAB.
4. Ci(1955)1. Annual Report, 1955, Wum Division, NAB.
5. Ci(1956)1a. Annual Report, 1956, Wum Division, NAB.
6. Ci(1957)3. No. 195. Annual Report, 1955, Wum Division, 1955, 1956 and 1957, NAB.
7. E(1949)2. No. 23230A, Vol. 1. Annual Report, Bamenda Province by H. J. S. Clark, Acting Resident, NAB.

8. Gc/b(1955)1. No. LG 1845. Handing Over Notes, Wum Division, NAB.
9. Ja/b(1965)3. Wum Central Council Minutes, NAB.
10. Ja/g(1929)8. No. 192/29. Fungom District Assessment Report, NAB.
11. Ja/g(1949)1. Bamenda North Western Federation of Bikom, Aghem, Bum, Fungom, Esimbi and Beba – Befang Native Authority, NAB.
12. Ja/g(1950)1. No. 106, Annual Reports (Reports of 1952), NAB.
13. Ja/g(1957)1. No. WD/1A/VOL. 4. Annual Report, 1957, Wum Division, NAB.
14. Ja/g(1959)2. Wum Divisional Native Authority Council Minutes of Meeting, NAB.
15. Ja/g(1964)1. No. 554. Kom – Bum Council Committee Minutes, NAB.
16. Ja/g(1964)5. Kon District Council, NAB.
17. Ja/g(1964)6. No. CI. 553, Wum Central Council Committee Minutes NAB.
18. Ja/g(1966)8. Councils: Menchum Security Reports 1966 – 1969, NAB.
19. Ja/g(1968)1. No. CI. 5554. Kom – Bum Council Area Executive Com. Minutes, NAB.
20. Ja/g(1968)4. CI. 551. Wum Area Council Minutes of Meetings, NAB.
21. Ja/g(1968)5. No. CI533. Wum Area Council Minutes Ex. Com. Meetings, NAB.
22. Kc/e(1960)1. No. F. 241. Tax Assessment and collection, Wum Division, NAB.
23. L/f(1954)1. No. B. 1559, NAB. N. W. Treasury Estimates 1954 – 55, 1953, NAB.
24. Lf/a(1949)1. No. B. 725. Bamenda N. W. Federation Estimates, 1950 – 1951, NAB.
25. Lf/a(1960)1. LGP 532/S. 7. N. A. Estimates, 1960/61, Wum Division Advance Proposals, 1959, NAB.
26. Lf/g(1950)1. No. 1068. Annual Financial Returns: N. W. Native Treasury, NAB.
27. Ma/a(1956)1. No. 3210/S.1. Remuneration of Native Court Members, NAB.
28. Ma/a(1968)1. No. C2. 1116 Vol. I, 1968/69. 70/71 Customary Court Statistics, 1970, NAB.
29. Nwoba, M.O.E (May 2015). An

Evaluation of Social Services Delivered by Local Governments In Nigeria: A Study of Ebonyi State Local Governments Administration (1996 -2012). Journal of Policy and Development Studies Vol. 9, No.3, pp.142-152.

30. Qb/c(1955)2. No. NR 217/Vol. I. Agricultural Shows, Southern Cameroons, NAB

31. Qb/c(1966)1. No. CI. 1019. Fundong Market: Kom – Bum Council, NAB.

32. Sb(1951)1. No. V. 1680. Grant to Missions for Medical and Educational Purposes by Native Authority, 1951, NAB.

33. Sb/a(1959)10. No. LG. 1970. Education and Executive Committee Minutes: Wum Divisional Council, NAB.

34. Tem, Protus Mbeum (2016). Flaws in the Native Administration System in Southern Cameroons: A Factor for the 1949 Creation of Local Government Units, Afro Asian Journal of Social Sciences. Volume VII, No I, Quarter I, pp. 1 – 24

35. ----- (2016). Proliferation of Native Courts in Wum District, Southern Cameroons, 1921-1939. Lagos Historical Review, Vol. 15, pp.59 – 76.

36. Torjman, Sherri and Leviten-Reid, Eric (2003). The Social Role of Local Government. Canada: The Caledon Institute of Social Policy.

37. United Nations. 2000. Responding to Citizens' Needs: Local Governance and Social Services for All. Report of the United Nations Global Forum on Local Governance and Social Services for All, Stockholm, Sweden, 2-5 May 2000, The Department for Economic and Social Affairs and the United Nations Development Programme.

38. Vires, J. De (1998). Catholic Mission, Colonail Government and Indigenous Response in Kom (Cameroon). Leiden: African Studies Centre.

39. West Cameroon Official Gazette Complement, 1963, NAB.

❐ ❐ ❐

Impact of Natural Disasters on Electoral Prospects of Contestants in the Indian Context

Chaganti Nagaraja Rao, Ravulapati Madhavi

Paper presented at the 76th Annual Conference of the Midwest Political Science Association, **Chicago** (April 5-8, 2018).

Introduction

The presumption that natural disasters affect the electoral prospects of contestants is debatable. There are several factors that influence the voters in choosing their representatives to political institutions and these factors differ while voting from one political institution to another. Mitigation of natural disasters, prevention of terrorist attacks and crime waves, regulating life in all aspects, protecting the people by ensuring safety and security to them and protecting the country against the adverse effects of these incidents are the responsibilities of the government to fulfil. Politicians deserve punishment by voters for their failure to protect them through measures against natural disasters. When governments fail to provide relief to voters, it will manifest the inefficiency and incapacity of the government to comply with the situation. The only course of action left for the voters is to defeat the government and elect a new one at the next election. But the occurrence of natural disasters cannot be the lone criteria for punishing the incumbent politicians.

Relief measures are to be taken at various levels-local, state and national--to mitigate the effects of natural disasters. But their effect on electorate is of no consideration since the voters vote a party to power rather than a candidate. In most of the elections it is the political party more than the individual contestant that is important. Reasons for electing or defeating leaders at various levels or for various institutions are different. The question of considering the antecedents of individuals at the time of voting arises only in local body elections but not while voting at Parliament or State Assembly elections where the issues of priority differ. Elected bodies function for the period for which they are elected. For example, all the elected bodies in India function for five years

unless the bodies are dissolved earlier for specific reasons. A disaster that occurs sometime during the tenure of five years will not affect the electoral prospects of incumbents at the subsequent election that takes place after a long gap of time.

Abnormal weather is not a quasi-random variable for assessing the impact on electing governments or public representatives. It is not correct to presume that "voters penalize incumbent politicians for occurrence of natural disasters," but voters penalize incumbent politicians for not providing relief measure to mitigate the effects of natural disasters which will adversely affect their lives and properties. It is more inappropriate to believe that "the punishment is limited to opposition incumbents." The reasons are clear. The opposition incumbents have no power to exercise. They have only an opportunity to criticize the incumbents in power for their failure to respond adequately to the disasters whenever they occur. The voters penalize only incumbents of the ruling party.

If there are certain specific measures that can be employed to ensure victory of a party, the party in power never fails to employ these measures to continue to stay in power as long as democracy prevails. Voters punish their local representatives when they are not able to provide relief assistance, whether they are aligned with the government or not. Voter turnout and voting in favor of a party or contestant are not based on drought and heavy rainfall. It is practically impossible to establish a cause and effect relationship between these events. Politics is not an empirical science to predict the results of experiments or actions.

It is often believed that if politicians provide disaster relief, they can escape electoral punishment. But it is not established by any practical example or historical evidence. Even those who rendered invaluable services throughout their term of office, not only after calamities or disaster occurred but on all occasions, and those who played a dynamic role in the development of their locality throughout their term of office also faced humiliating defeat at the next elections, while novices to politics have won elections even without any previous political history or background, owing to certain circumstances prevailing at the time of elections. The reasons are clear--the candidate who contests on a party affiliation may not represent the wishes of the electorate at large. Quite naturally he faces defeat. A novice to politics who represents a party that has a clear agenda or manifesto of development that fulfils the wishes of the electors may succeed in the same elections since it is the party and its

manifesto that are important more than the antecedents of the contestant or the local issues.

As far as the voting pattern in India is concerned, it is not established at any election during the last seven decades of free India that natural disasters influenced voters in choosing their candidates in the elections.

Policy Preferences

People's choice of a government or a party or a contestant depends on policy preferences. Voters do not punish opposition members of Legislative Assemblies for government's failure to provide disaster relief since opposition members have no power or authority to demand service but can only beseech the government for relief. It is the MLAs of the ruling party who are often criticized for their or their government's failure to provide relief for the victims of the disaster. The opposition party MLAs will only have a chance to nag the government for its failure to provide the required relief when disasters occur.

If natural disasters lead to electoral disasters for politicians, India will have to go to elections once or twice a year to seek a fresh mandate from the voters based on the effects of disaster since floods occur at least once or twice. Voters while voting at elections to the Assembly or Parliament do not keep in view the track record of the contestants, but the electorate in general is led by the policy of the party and the stability of the government more than the previous achievements of the government or the likelihood of its better performance after the election. Several examples can be quoted from the history of democracy in India. The people of India had voted the Indian National Congress (INC) to power during the first three decades after independence, not because the party performed well but because there was no alternate political party to establish a stable government that functions for full term in office. When all the opposition parties joined together and formed the Janata Party and contested against the Indian National Congress in February 1977, the Congress was defeated for the first time and the alternate political party, the Janata Party (loosely knit factions), was voted to power. When the newly formed Janata Party government could not provide a stable government and could not govern the country efficiently it led to midterm polls in 1980 even without its completing three years in office. As there was no alternative for the people to choose, the Indian National Congress was voted back to power with two thirds majority in the lower house of the Parliament after a gap of three years. It was clear that voters

voted for a stable government more than all other issues. Thus, it is necessity and the prevailing situation that prompt voters to vote a party to power but not the occurrence of natural disasters alone. The same was the case with elections to the State Assemblies.

Once, a newly elected member of the Andhra Pradesh State Assembly openly declared after he was elected with a clear majority in 1994 that he never expected that he would get elected as MLA since he was quite a novice in politics and had practically no political background and he didn't meet even a small section of voters soliciting votes. He further stated that he contested the election only because he was nominated by the party and since no other party man came forward to contest the election from this constituency. Then what was the basis for his resounding victory? It was only the party and its leadership besides the anti-incumbency factor. Disasters played no role in his election prospects.

Disaster relief is a responsibility of the government and the local public representatives. The voters who are adversely affected by the disaster naturally resent the leadership of their elected representatives and will express their resentment through retrospective voting at the next local body elections. But the election prospects of the candidates contesting to the State Assembly or Parliament do not depend on the disaster but rather on disaster preparedness and disaster relief. There are certain cases in which MLAs were re-elected at the next election even after their miserable failure to provide disaster relief since the vote cast in favor of a candidate is not only for the candidate but also for the party, since its manifesto may be very attractive or convincing to the voters, or voting the party to power may be necessitated by the prevailing circumstances. Disaster occurrence and disaster relief are among the several factors of consideration but not the only issue before the electorate.

Negative Voting or Anti-incumbency Factor

Anti-incumbency factor is an important issue in every election. People vote a party to power not with full faith in the party or party leadership but against a party and resentment against the party. In most of the elections in India it was the vote against a party that brought its opponent to power more than the positive role of the party that was elected. Elections to the State Assembly of Andhra Pradesh held in 1983, 1994, 2004, and in 2014 testify to the fact that voters vote a party to power out of necessity or the failure of the previous government rather than the hope that the next government will perform better. In the South Indian State of Andhra Pradesh, the people

continuously elected the Indian National Congress Party (INC) in all the six general elections held after independence (1952-78) as there was no alternate political party to form a stable government in the state. At a time when the people were fed up with the performance of the INC government in the State and were eagerly looking for an alternative, the Telugu Desam (TD) Regional Party was founded by a popular matinee idol and supported by a few dissident members of the INC. The party contested all the seats in the Assembly and was elected with 2/3rd of seats in the State Assembly in the elections held in January 1983, though the party was established hardly nine months earlier and had no achievements of its own after its inception. The defeat of the INC party, for the first time after independence, was to be attributed to no natural calamities or disasters. Neither was it any positive role of the newly founded regional party that prompted the voters to vote the regional party to power but it was the miserable failure of the incumbent INC party in every aspect of life that subjected the party to humiliating defeat for the first time in the history of the State and reflected the voters' resentment against the INC party. After the failure of the newly founded Telugu Desam regional party during its seven year inept rule, the INC was voted back to power in December 1989. The INC proved its inefficiency and failure during its next five year rule that led the voters in December 1994 to elect the TD regional party again with thumping majority even without looking into the antecedents of the contestants. In all these elections voters cast a negative vote. The voters voted not in favor of a party they liked but against a party they disliked. It was rather expression of resentment against the party in power or anti-incumbency factor that worked with the electorate. What one observes in all these elections is that it was the voters' resentment against the incumbent party for its failure that made them choose the other political party rather than their like of the political party they voted for.

During 1996 the state was hard hit by cyclones very frequently and the relief measures provided by the State Government were not to the extent required. But the adverse effect of the cyclones hardly had any effect on the election prospects of the incumbents in the elections held to the State Assembly in September 1999. The same Telugu Desam regional party was again voted to power for the successive second term since the populist programs initiated by the government found favor with the average voter. Incumbents are not blamed for extreme weather conditions. Since public memory is always very short the voters didn't penalize the party in power when elections were held after a gap of three years of the occurrence of disaster. The

records of rainfall and crop conditions maintained by the village record keeper did neither influence the voting pattern, nor decide the next government. A host of factors influence the electorate in choosing their representatives or a party at the elections but disaster or heavy rainfall alone is not the sole criteria in judging a party's or a contestant's performance. Natural disasters may be a relevant factor but not a deciding factor for the success of political party or its contestants.

Distribution of money, liquor and other gifts to woo voters has become an integral part of elections. But mere offer of gifts will not change the voting pattern or the voters' decision. During the last Assembly elections held in May 2014 in the newly formed state of Andhra Pradesh voters had voted the TD Party to power, which they defeated twice in 2004 and 2009 elections, despite better sops given by other parties since the prevailing situation necessitated a stable government more than any other issue. The TDP had won the elections with comfortable majority and formed the government. It clearly proved that after voters' awareness has increased, voters have begun to accept sops or favors from each contestant but vote in favor of the party they liked since voters in a democracy give first preference to stable government more than any other issue and it was the party and its leadership but not the candidate that would matter while voting at the elections to the State Assembly and Parliament. An elected candidate smeared with innumerable accusations and misdeeds would generally enjoy his fixed term or tenure before any adverse indictment is released. Judicial generosity for principles of natural justice would become soothing relief and contentment for the accused political candidate. Hence political contestants desist from introspective exercise.

In India, it is an established fact that leaders are never punished for events not only outside their control but even for events within their control. Politicians in India are never punished for adverse weather conditions since effective government response comes from the official machinery which helps to improve the electoral prospects of leaders. The peculiar situation in Indian democracy is that politicians take credit for the achievements of the officials, and officials receive punishment for the failures or offences of the politicians. Hence the question of extreme weather conditions influencing the voters in the elections will never arise. People are not unaware of the fact that extreme weather conditions are acts of God which recur every year for which nobody can be held responsible. "*Circumstances may be beyond man's control, but it is within the man to react*

to circumstances." The principle that governs voters' minds is whether the elected representatives or the officials have properly responded to the people's needs or not; but not extreme weather conditions and their consequences.

Since adverse seasonal conditions, draughts and heavy rainfall are regular features in India they cannot shape electoral outcomes in India. A practical example is discussed here. A devastating cyclone had adversely affected a fertile region in Krishna district of Andhra Pradesh in November 1977 but the party in power at that time was voted back to power in the elections held hardly four months later (in February, 1978). The reasons for the party's victory were not only that the party in power responded promptly and restored normalcy in the entire region and provided better infrastructure, but also because there was no alternative effective and well organized political party for the voters to choose. It is, therefore, clear that the response of the government to adverse effects of natural disaster made voters repose their confidence in the government in office and re-elect it, besides there being no alternate political party to form a stable government.

Voters repose their confidence in a particular candidate or party based on several factors and the institution to which elections are held: voters' preferences differ from one political institution to another--Parliament, State Assembly and Local Bodies (Municipal Councils and Village Panchayats). While the country's foreign policy, taxation policy, ability to withstand external aggression and to effectively deal with internal disturbances are the criteria for voting at the elections to Parliament, state-level issues like prices of essential commodities, employment generation in public sector, poverty alleviation programs, financial assistance for local civic services, anti-incumbency factor are the criteria for voting at Assembly elections. When it comes to elections to local bodies the issues are entirely different. The foremost consideration while voting to local bodies--both urban and rural--is the caste of the contestant. Since caste alone decides the voting pattern in most cases for local bodies all other considerations are set aside. This is truer of the South Indian State of Andhra Pradesh. The services rendered during the candidate's previous term, his character, integrity, spirit of service, ability to effectively deal with disasters etc. never count for local body elections. Besides caste, distribution of sops, which puts democracy to shame, plays an important role in choosing the local leaders (Ward Members of Urban and Rural Local Bodies). But even in the elections to local bodies adverse seasonal conditions never played any

role in the election prospects of contestants during the last several elections held to the Urban or Rural Local Bodies.

Alignment of Political Parties

Alignment between different parties certainly plays a decisive role in elections to the State Assembly and Parliament. Certain regional parties, whose political activity is confined to the States only (like Telugu Desam Party in Andhra Pradesh, Anna Dravida Munnetra Kazhagam in Tamil Nadu, Telangana Rashtra Samithi in Telangana, Trinamul Congress in West Bengal), are powerful political parties within their respective states and alignment or electoral adjustment with those parties are often beneficial to the National Political Parties which cannot exercise their independent influence in the elections in the respective states. Such alignment or electoral adjustment is a must for the National Parties to improve their election prospects at the Centre (National Government). In all these cases, disasters, relief measures, contribution from national calamity fund etc. have very little effect on the election prospects of political leaders.

The role of the Member of Legislative Assembly (MLA) in case of disaster relief is *that the MLA helps the local population use the various relief mechanisms offered by the central and state governments. The MLA achieves this goal by requesting resources, monitoring the work of the local bureaucracy, and channeling citizen demands to the bureaucracy and political officials at higher levels.* If the MLAs could play this role effectively the question of penalizing them for occurrence of disaster will not arise. However, this role of the MLA alone decides neither his election prospects nor the prospects of the political party he belongs to at the next election.

Vote for Stability

People vote a party to power not only because of their affinity to it or because of its positive role in administration during its previous term but because of their hatred of others parties. In most elections it was the vote cast against the party in power rather than vote in favor of a party of their choice that brought a party to power, only because the voters desire to elect a stable government which functions for a full term. Parties often come to power with negative vote against their rivals but not positive vote in their favor. In the South Indian state of Andhra Pradesh, people continually voted the Indian National Congress to power in six elections over a period of 31 years for the simple reason that there was no alternate political party to contest all the 294 seats in the State Assembly and could form a stable government. When a new regional

party called the Telugu Desam Party was formed in March 1982 and contested all the seats in the general elections held to the State Assembly in January 1983 the regional party, without any previous history and with hardly nine months' standing, swept the polls winning 2/3rds of the seats putting the INC to humiliating defeat and virtual rout, which clearly shows that people want stable government. Again after a gap of seven years the electorate voted Indian National Congress to power in November 1989 defeating Telugu Desam Party in the elections held to the State Assembly although the electorate was not unaware of the inefficient and ineffective role it played earlier, for the simple reason that the people were fed up with the misrule and corruption widely prevalent during the seven year rule of the Telugu Desam regional party. In neither case disasters or their aftermath played any role in the election process. Voters in both cases decided to "*vote for stability rather than vote for service.*"

It may not be proper to draw a conclusion that natural disasters will have effects on electoral success of aligned and non-aligned incumbents. Among the various problems that voters face, natural disasters are one of the issues of consideration while voting but not the be-all and end-all of electors' decision. Natural disasters will not have an effect, either negative or positive, on the electoral performance of either aligned or unaligned incumbents but the relief measures or the response of the persons in power to disasters may affect the electoral performance only to some extent since other important contributory factors greatly influence the votes' minds. The presumption that aligned MLAs have a clear advantage in mitigating the electoral backlash in the face of natural disaster sounds rather odd in the Indian context and leads to the question *"Whether occurrence of natural disaster has a direct link to electoral performance of public representatives?"* Politicians who are able to distribute relief will definitely avoid punishment but the occurrence of natural disasters will never be the lone criteria for electorate to choose their representatives at any election to any elective office. Voters punish their representatives in a democracy only by defeating them at the next election. Beyond this there is no legal provision to punish them in the Indian democratic set up. There were certain sporadic cases of initiating legal proceedings against awfully corrupt politicians and putting them behind bars but some were ultimately acquitted by courts on some ground.

A detailed analysis of the voting pattern of electorate during the last several general elections to the Lower House (Lok Sabha) of the Indian Parliament discloses various important

criteria that voters consider in voting. Factors that govern the voter's mind are anti-incumbency factor, performance of the government while it was in power, successes and failures of government in attending to important state or national issues, party's election manifesto, etc. but not merely the occurrence of disasters. Public representatives, whose performance was dismal in times of natural calamities or other crises, were sometimes re-elected with thumping majority at the next elections since there was no alternative to them or the party they represented.

People are retrospective in voting but the assumptions do not include disaster occurrence and relief measures. Retrospective voting cannot be attributed to natural disasters. Politicians who are aligned with higher levels of government are in a better position in their efforts to obtain relief funding than others. But relief cannot be denied by government to areas represented by opposition members on any flimsy ground since it is ultimately the people who have to receive relief and not the incumbent politicians. Some politicians provide more relief than others due to either necessity or due to personal influence of the politician in the government. If the contestants can take advantage of weather conditions for election purpose, the governments would not fail to seek a fresh mandate from the people every time a state or nation is adversely affected by disaster. There is no correlation between abnormal weather and constituency characteristics. The presumption that "*voters do penalize incumbent politicians for natural disasters,*" is also not substantiated by any practical example. It is also not appropriate to believe that "the punishment is limited to opposition incumbents, that is, those who are not aligned with the nation's prime minister or the state's chief minister," since incumbency factor works against the ruling party members only but not against the opposition members. In the Indian democracy the roles of different public entities are specified in the Acts governing various government departments. While the decision-making lies with the elected members, the implementation of policy or decision lies with the official machinery. Therefore, the question of punishing the elected public representatives for disaster occurrence never arises but it is the official machinery which is taken to task by the government for not rising to the occasion in providing relief measures. It is also clear in the Indian context that voters never punish their local politician for not aligning with the government. Elected public representatives have to function within the party's policy framework and hence aligning with the country's prime minister or state's chief minister for the

sake of getting relief for disaster occurrence does not arise. Aligning with the leader in power arises for politicians to improve their personal image as well as gain a political advantage. Permutations and combinations among political parties for forming alliance to form government arise when no party in the legislature commands absolute majority. In such cases, members of smaller political groups in the legislature ally with party in power only for their political advantage, but not for getting relief for disaster occurrence. Hence the need for aligning with a party in power for the sake of getting relief for disaster occurrence does not arise for the opposition members.

Natural Disasters and Voter Turnout

Drought and heavy rainfall have no noteworthy effects on voter turnout. There were no occasions when *"drought and heavy rainfall are associated with a clear reduction in people's confidence in politicians."* In fact, when the performance of an elected official is not satisfactory as per the electors, the voter turnout will be higher since the irate or enraged voters will be more serious about defeating the incumbent rather than electing someone else. Therefore, there will be no reduction in voter turnout. There are several examples to establish this fact in India and the Indian states. People's confidence in politicians reduces when the elected public representatives fail to perform their legitimate duties and are unable to come up to the expectations of the people in respect of service delivery. People who have access to relief for natural disasters are less likely to punish politicians since the relief received for disasters is generally attributed to the role of the politicians. It is a general presumption that if politicians provide disaster relief they can escape electoral punishment. But mere provision of relief for disasters is not the only consideration for the voters to vote at an election or in favor of a candidate. If electoral fortunes of candidates are decided by the relief provided by the politicians, politicians would take, for every election, the best advantage of every disaster that frequently occurs in Indian states. In respect of responding to natural disasters, governments naturally provide better relief in areas controlled by ruling party members than in the areas controlled by the political opposition. The government cannot straight away deny relief totally in areas controlled by the political opposition just for the simple reason that the area is controlled by the political opposition.

Politicians' hold on electorate depends on their ability to respond to people's needs including relief during natural disasters. People make informal choices based on policy

preferences. The voter behavior reflects on the response of the incumbent on existing public issues. But there were occasions when voters voted in favor of a party even if the voters didn't like the contestant since the vote is more in favor of the party than in favor of the individual contestant. For example, the regional party of Andhra Pradesh state in India was based on regionalism. Certain communities who aligned themselves with a national party since the country's independence were totally opposed to the regional party and they always voted against it in every election. But a situation arose when the national party, the Indian National Congress almost died in the state in 2014 winning no single seat in the State Assembly due to the maximum harm the party government had done to the people of the State, and there was no alternative for them to vote except for the regional party which they defeated in the two previous general elections to the State Assembly in 2004 and 2009 and to which certain communities were traditionally opposed. It was a vote cast against their own conscience. One has to choose the good between the good and the bad and one has to choose the bad between the bad and the worse. This is unavoidable and inevitable in democracies where periodical elections are a regular feature. Among the various issues of consideration for the voters to decide their candidate, disaster and disaster relief played a very minute or no role in their choice of a candidate to be elected. Local elected public representatives will no doubt receive blame for government's opportunism in disaster relief. It is government's responsibility to implement measures to effectively deal with disaster and to mitigate its effects, not local elected representatives'.

The presumption that *"natural disasters are often electoral disasters for politicians"* has never been proved true in the Indian context; it is rather the relief efforts of the incumbents that are a matter of consideration for the voters to vote. Politicians who are aligned with party in power may also sometimes fail to provide the relief measures required for complete restoration of the disaster-affected areas. It, therefore, follows that politicians who respond to disaster efficiently and effectively win the favor of the electorate but not the politicians who are simply aligned with the party in power. It is also not true to say that *"voters react to the negative effects of natural disasters by reducing their support to the incumbent,"* but voters naturally resent the ineffective role of the incumbent in mitigating the negative effects of the disasters.

An important point for discussion here is how far it is a fact that "voters simply assess the quality of their life during the incumbent's tenure and vote accordingly," from the Indian point of

view. There were days when incumbents, whose performance as responsible public representatives was dismal during their previous tenure, were re-elected as they could easily lure voters with sops and promises. But recently the voters have become intelligent enough to accept money or gifts from all the contestants but vote in favor of a party, even disregarding the contestant, keeping in view the larger interests of the state or the nation. *"Voters do not try to assess the role of the incumbent's policies"* since an incumbent will not have a policy of his own but it is the policy of the party he belongs to that matters. *"Disaster relief may mitigate the negative effects,"* to some extent but disaster relief alone is not the sole criteria for choosing an incumbent in the elections.

It was observed in certain studies that *"Studies of retrospective voting are particularly relevant to Indian politics because frequent droughts and floods caused by heavy rainfall made incumbents potentially vulnerable to electoral backlashes caused by natural disasters,"* but it was not proved in any elections, and so the observation is not always completely acceptable. It is true large parts of India experience disasters and floods frequently but the occurrence of disasters and floods would not make the incumbents potentially vulnerable. Certain politicians command respect in the constituency by virtue of caste, economic power, previous services rendered to the people, traditional attachment to the people and other reasons besides the absence of a potential opposition candidate which make them too formidable and irresistible to be defeated. Disasters or floods will not change their electoral prospects. This is how certain politicians got elected continuously even for seven or eight times.

In fact there were occasions when voters voted a candidate even without knowing him or even without hearing his name since an individual MLA or MP plays no role in government but is controlled by the leader of the party or the party high command. Therefore, every vote cast in favor of a candidate is a vote cast in favor of the party and the party leader. It cannot be said that no disaster or flood occurred during the long tenure of the elected public representatives but they did not change the electoral prospects of contestants.

Charisma of the party leader

As far as the elections to the Indian Parliament or State Assemblies are concerned, the charisma of the Prime Ministerial candidate and the manifesto of the party are the central factors for the voters to consider while voting at the national level and the charisma of the Chief Ministerial candidate or the leader of the party and the party manifesto are the decisive factors for the voters to vote at state level.

While the role of disaster relief in promoting election prospects of contestants is minimal, the charisma of the leader of the party plays a decisive role in elections to the Parliament and the State Assemblies. Jawaharlal Nehru, the topmost leader of India's freedom movement became the unquestioned Prime Minister of India on India attaining independence whose international reputation and personal charisma led the Indian National Congress to victory for four times successively despite several natural calamities and famine that the country witnessed during his tenures, because of the unstinted faith of the people in his patriotism and dynamic leadership. His daughter Indira Gandhi, who was Prime Minster for a continuous period of 11 years in the first spell, winning two elections and 5 years in the second spell, winning another election, led the nation through 16 turbulent years facing no defeat as long as there was no alternative to her leadership or the Indian National Congress Party. Her personal charisma, coupled with India's victory in Indo-Pak war of 1972, her poverty alleviation programs and her initiatives for the uplift of weaker sections worked well with the electorate as long as there was no alternative to the INC. While the INC faced miserable defeat for the first time in independent India in the general elections to the lower house of the Indian Parliament in 1977, she lost the election in her own constituency for her role in the excesses committed during the emergency during July, 1975-January, 1977. But when her successor government proved inefficient and incapable of handling the national affairs properly owing to internal squabbles, the INC headed by Indira Gandhi was voted back to power in 1980. Natural disaster has no role in all the four elections she faced in her capacity as the Prime Minster as well as the leader of the Indian National Congress party.

Electoral backlashes of contestants are attributable to the party's performance during its previous terms, general policy of the political party, anti-incumbency factor, etc. The track record of the individual contestants plays a role only in certain select constituencies but the electorate at large is always led by the contesting political parties and their election manifestos and the prevailing situation in the state or the country. Thus, natural disasters cannot be an issue of consideration for voters in electing a government.***

❐ ❐ ❐

Sustainable and Smart Solid Waste Management

A. K. Jain

Solid Waste, commonly known as trash, garbage or municipal waste includes food waste, yard waste, bottles, paper plastic, packaging and other wastes from residential, commercial, institutional and industrial sources. It is classified as municipal waste, industrial waste, construction and demolition waste, bio-medical waste, electronic waste, and nuclear radioactive waste. Waste management refers to the collection, transport, processing, recycling and safe disposal of the waste materials for safety of the environment and public health. The Solid Waste management (SWM) usually relates to waste generated by human activities and its containment to reduce their effect on health, environment or aesthetics.

The problem of solid waste management in Indian cities is mounting due to increasing population, urbanisation, changing lifestyles and consumption patterns. It is estimated that nearly 30 per cent of the garbage is not collected which creates hygiene, public health and environmental problems. As per Planning Commission (2014) Delhi generates 7500 metric tons (mt) per day of solid waste, of which only 4500 mt is collected and only 2500 mt is treated.

According to the statistics given in a paper in Nature (Hoorenwig, et al, 2013) the total municipal solid waste (MSW) generated in urban India stands at 62 million tons per year or 160,000 TPD. This is predicted to increase by a factor of 2.7 by the year 2030 and 7 by 2050. Only 60 per cent of total waste is collected, of which 30 per cent is treated and rest goes to dump sites, rivers, roads, parks and nallas (drains) causing serious problems of health and environment.

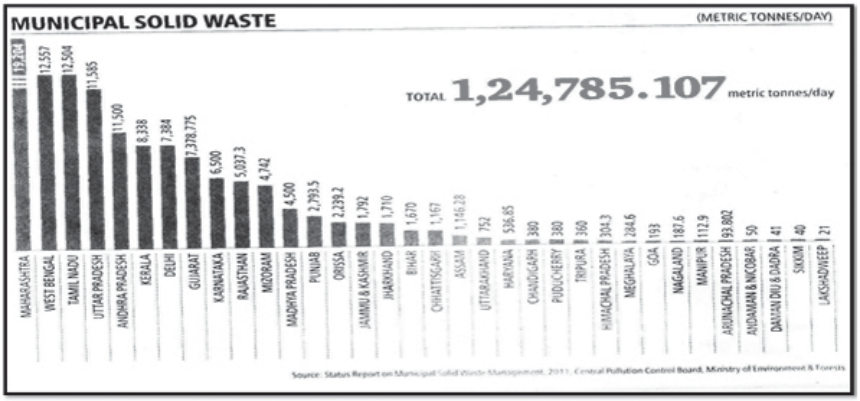
The following table indicates average waste generation per capita per day in India:

Table 1: Waste Generation Per Capita per Day

S. No.	Land use type	Estimated waste generation
1	Residential refuse	0.3 to 0.6 kg/cap/day
2	Commercial refuse	0.1 to 0.2 kg/cap/day
3	Street sweepings	0.05 to 0.2 kg/cap/day
4	Institutional refuse	0.05 to 0.2 kg/cap/day

Source: Manual on Solid Waste Management, CPHEEO – (2000)

Fig. 1: Municipal Solid Waste in India-State-wise Output



Source: Status Report on Municipal Solid Waste Management, 2011, Central Pollution Control Board, Ministry of Environment and Forests, New Delhi

Industrial Waste is produced by the factories, mills and mines. The industrial waste can be non-hazardous, non-toxic, such as waste fibre produced by agriculture, or it could be toxic, chemical and hazardous. It pollutes the water, air and land.

Construction and Demolition Waste (C & D Waste): The progressive pace of construction and demolition in civil works has enhanced the debris to a large extent. It could be as high as one-third of urban waste in areas having extensive construction activity, while 15 per cent in a normal situation. It needs to be treated separately, which can be recycled to a large extent.

As per the Construction and Demolition Waste Rules, large waste generators (above 500 MT) are to recycle and reuse construction and

demolition waste at the site (minimum 20%) for reconstruction purposes meeting structural requirements. Recent initiatives of the Government of India (MOUD) at the Redevelopment of Residential Complex of East Kidwai Nagar (New Delhi) have shown that it is possible to provide for 100 per cent recycling and reuse of C&D Waste at the construction/demolition site itself. Such models obviate the need for transporting the C&D waste to a centralised unit and transporting the reused materials such as bricks, to the construction sites. This is cost-effective and environment friendly.

Electronic waste may be defined as all secondary computers, entertainment devices, mobile phones and other items, such as television sets and refrigerators and other used electronics gadgets.

Bio-Medical waste comes from biological sources, diagnosis and treatment of diseases. Common producers of bio-medical waste include hospitals, health clinics, nursing homes, medical research laboratories, dispensaries of physicians, dentists and veterinarians, healthcare and funeral homes.

Nuclear or Radioactive Waste

Nuclear or radioactive waste means any waste material containing radio-nuclides in quantities or concentrations. The disposal of such waste includes the release of radioactive material to the environment in a manner leading to loss of control over the future disposition of the radio-nuclides contained therein and includes emplacement of waste materials in a repository beings or animals or in research activities in these fields or in the production or testing of biological waste. Such wastes must be managed through Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987.

Critical Issues in SWM:

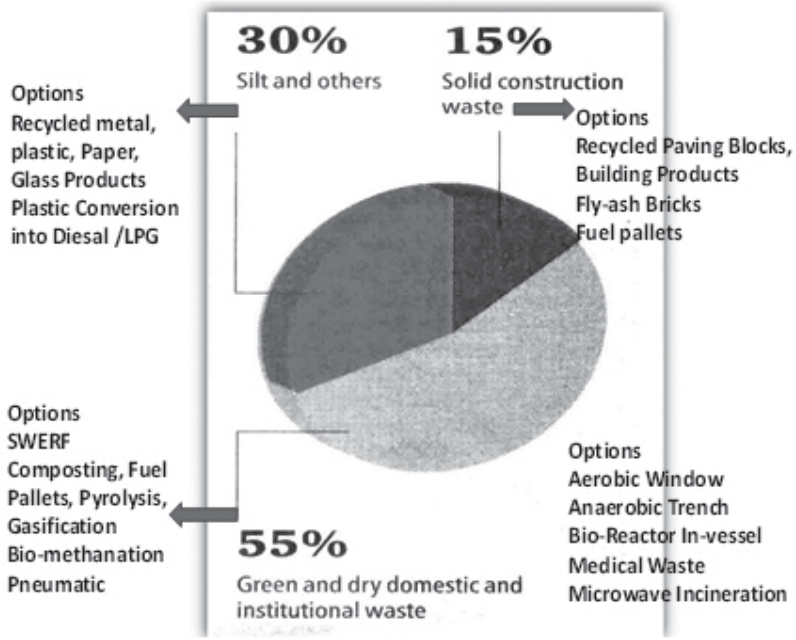
- Storage of waste at source is lacking
- Segregation of recyclable waste is not done at source
- Primary collection of waste is not done at place of generation
- Design and location of municipal waste storage bins and depots are inappropriate, resulting in its littering
- Street sweeping is not done regularly
- Waste transportation is done in open vehicles
- Waste processing is partially practiced in large number of cities
- Final disposal is done through crude dumping

- Inadequate arrangement of municipal bins/dump sites cause insanitary conditions

Planning and Management Issues:

- Lack of sites for landfills, SWM plants, waste recycling and processing facilities
- Lack of planning for waste management
- Lack of competitive institutional set-up and monopoly of urban local bodies
- Lack of trained manpower
- Lack of expertise to modern systems of waste management
- Lack of awareness
- Lack of Management Information System
- Lack of funds and user charges
- Lack of community involvement

Fig. 2: Municipal Waste Composition and Options



Initiatives in SWM: The Swachh Bharat Abhiyan (2014-15):

The Government of India launched a Pan -India Swachh Bharat Abhiyan (Clean India Campaign) on 2nd October 2014, which was 145th birthday of Mahatma Gandhi. The campaign covers 4041 statutory towns for the cleaning of the roads and infrastructure. The primary goal of the campaign is to achieve the vision of a 'Clean India' by October 2019 which will mark the 150th birth anniversary of Mahatma Gandhi. The Urban Development Ministry has earmarked Rs. 6,20,090 million and the Ministry of Drinking Water and Sanitation will spend Rs.13,40,000 million for the Rural Programme.

Making the human settlements open defecation free is a major component of the Swachh Bharat Abhiyan (SBA). For this 6.7 million individual toilets are to be built in urban areas, of which 5.2 million have been built (till March 2018). Also, against the target of half million community toilets, 0.35 million have been built. Management of solid waste is another area of focus of the SBA, which is one of the largest sanitation programs in the world. A sense of competition has been created among the cities through annual cleanliness surveys and award programmes.

The government of India has also initiates the following in the field of SWM

- Bio-medical Waste Handling Rules, 1998
- Municipal Solid Waste Management Rules, 2000
- Reforms Agenda (fiscal, institutional, legal)
- Technical Manual on Municipal Solid Waste Management
- Technology Advisory Group on Municipal Solid Waste Management
- Inter-Ministerial Task Force on Integrated Plant Nutrient Management from city compost
- Tax-free bonds by ULBs permitted by the government
- Income-tax relief granted to waste management agencies
- Public-private partnership in SWM
- Capacity building and skilling
- Creation of Urban Reforms Incentive Fund
- Guidelines for setting up of regulatory authority
- Model municipal by-laws framed

The "Municipal Solid Waste (Management & Handling) Rules, 2000", require the following compliances:

- Development and Improvement of properly engineered and constructed sanitary landfill (SLF) from which pollutants do not escape and have an impervious bottom layer for leachate collection and treatment
- Identification of landfill sites for future use and making site(s) ready for operation.
- Setting up of waste processing and disposal facilities.
- Monitoring the performance of waste processing and disposal facilities
- Segregation of solid waste at points of generation, which includes organic and recyclable wastes (plastic, glass, metal, paper, etc.).
- Specialised handling of construction and demolition waste, bio-medical waste, industrial/hazardous/toxic waste, e-waste (electrical and electronic waste) and nuclear/radioactive waste.

Inert materials in the municipal solid waste have been steadily increasing (30-50%), bulk of which is generated from the demolition and construction activities. This needs a specialized storage, collection and transportation. Organic food wastes can be locally recycled and composed, which would reduce transportation cost and reduce landfill site demand. Bio-medical waste is generated in relatively smaller quantity in comparison to municipal solid waste, but due to its infectious and toxic nature it needs careful handling. This is regulated by the Bio-medical Waste (Management and Handling) Rules, 1998.

Storage of waste at source is the first step of Solid Waste Management. The waste should normally be stored at the source of waste generation till collected for its treatment and disposal. Biodegradable waste and non-biodegradable waste should be collected in separate bins, as given below:

- Green coloured bins – Waste bins for biodegradable waste
- White coloured bins – storage of recyclable wastes
- Black coloured bins – storage of other wastes

Primary collection of waste is the second essential step of Solid Waste Management. It ensures that waste is collected regularly and it is not disposed of on the streets, in parks, drains, water bodies, etc. Local bodies usually arrange for the primary collection of waste by the following methods or a combination thereof:

- Doorstep collection of waste through non-motorised and motorised vehicles with active community participation.

- Collection through community bins
- Doorstep or lane-wise collection of waste from authorised/ unauthorised settlements and community bins

There is a strong opposition to location of new landfills, which are seen as an environmental disaster, causing health risk from flies and rodent, air pollution and water pollution through leaching. The Government of India recommends that:

"Open dumping of the solid waste should be discouraged, if necessary, by legislative action to be enforced in a phased manner starting with the metropolitan cities. Recycling and resource recovery should be encouraged. It should be made mandatory by the Governments that the organic waste should be used for resource recovery and it should not be disposed by the land fill method. Proper regulations should be framed to regulate the landfill site and its maintenance."

A study conducted by the World Health Organisation titled "Management of Solid Wastes in Developing Countries" concluded that to achieve the lowest cost, a policy of encouraging multiple small composting plants should be followed. Various studies conclude that recycling wastes is by far the cheapest alternative to landfills; and plants that convert garbage into other products are cheaper than those that burn garbage. As such, it may be more practical to build several small, decentralised waste facilities rather than a large one.

The Role of the Rag Pickers

The informal sector is characterized by small-scale, labour-intensive, largely unregulated and unregistered low-technology recycling of waste materials and services. A large quantity of waste is dealt by the rag pickers (kabaris) or ends up in the open space, riverbed, drains, etc. According to Aseem Burman Committee (1998) the informal waste pickers are the backbone of waste management. They not only help in cleaning the neighbourhood, but also collect, reuse, recover and recycle an estimated one third of municipal solid waste per day.

The informal rag pickers in Delhi recycle about 3000 mt of waste per day. A recent study by WTERT of six Indian cities found that waste pickers recovered approximately 20% of waste, with 80,000 people involved in recycling approximately three million tonnes. It is estimated that every tonne of recyclable material collected saved

the ULB approximately Rs. 24,500 per annum and avoided the emission of 721 kg CO2 per annum. However, they face serious problems of health and essential facilities. In Bagota incentives like free bus ticket, food coupons and cinema tickets are given to waste pickers for collecting and depositing waste in the designated municipal waste collection centres. Learning from Colombia and Brazil where the rag pickers are officially recognized, Pune Municipal Corporation has also brought them in municipal SWM chain and provides them with remuneration, uniforms, waste bins and bags, gloves, pushcarts and health insurance.

Transportation of the waste

Transportation of the waste from waste storage depots at regular intervals is essential to ensure that no garbage bins/containers overflow and waste does not litter on the streets. Hygienic conditions can be maintained in cities/towns only if regular clearance of waste from temporary waste storage depots is ensured. Transportation system has to be so designed that it is efficient, yet cost effective. The system should synchronize with an easy maintainable system of waste storage.

Solid Waste Treatment Technologies

There are various technologies available for treatment and processing of waste in an environmentally sound manner. However, a technology suitable for one may not be appropriate for others. A comparison of these technologies is shown in table below:

Table 2: Comparison of Different Solid Waste Treatment Technologies

Element	Composting	Refuse derived fuel	Biomethanation	Gasification / Pyrolysis	Incineration
Technically and economically feasible size of operation per day fresh waste	50 TPD and above	100 TPD and above	1 TPD at small scale and above 50 TPD at larger scales of pure organic waste	500 TPD and above. Due to high moisture in our waste, suitable only for segregated dry waste.	500 TPD and above due to high moisture in our waste. Suitable only for segregated waste. However, sizes as small as 10-50 TPD of waste are available for commercial sale but not advisable due to high running costs.
Adopted Capacity for study	500 TPD	500 TPD	500 TPD	500 TPD Plant	500 TPD
Land required for adopted capacities	6 Ha	3 Ha	4 Ha	10 Ha	4 Ha

Waste Characteristics	Moisture Content >50% Organic Matter >40% C/N Ratio between 25-30	Moisture Content <45% Volatile Matter >40%	Moisture Content >50% Organic Matter >40% C/N Ratio between 25-30	Moisture content <45% Net Calorific Value >1200 Kcal/Kg	Moisture Content <45% Net Calorific Value >1200 Kcal/kg
Waste Suitability	Suitable for MSW Characteristics of India	Not suitable for MSW characteristics in India but workable with use of Auxiliary Fuel	Suitable for MSW characteristics of organic waste in India	Not suitable for MSW characteristic in India but workable with use of Auxiliary Fuel	Not suitable, due to high moisture in our waste.
Typical investment for assumed capacities (excluding cost of land)	INR 17-20 Cr. For a 500 TPD Plant	INR 17-20 Cr. For a 500 TPD Plant	Approximately INR 75-80 Cr for a 500 TPD Plant	INR 80-90 Cr. For 500 TPD Plant	NA
Recurring cost	INR 300 per ton of input waste	INR 290 per ton of input waste	INR 100 per ton input waste	NA	-
Recoverable	250 Kgs of compost per ton of waste	200 Kgs pellets per ton of waste	80 cum of bio gas / ton of waste plus 200 Kgs of manure / ton	NA	-
Volume reduction	45-55%	55-65%	55-65%	>80%	>80%
Environmental issue	Impurities in compose due to mixed waste, traces of heavy metals, leachate runoff	Problems in burning exhaust	Problems if mixed feed stock	Ash handling and Air Pollution	Ash handling and Air Pollution (emission of particular matter, chlorinated compounds dioxins / furans)
Technology Reliability	Running successfully in India	Running successfully in integrated facilities	Small scale organic treatment plant operational but mixed waste large scale plants failed in India	Insufficient operational experience for MSW	Only Plant in India failed due to mismatch in waste quality. MSW 2000 has recommended for incineration of waste only after doing a waste suitability analysis and providing adequate flue gas management methods.
Limitation	Large Land Requirement, Non acceptance of compost as soil enrichener in some areas of the Country Process depends highly on factors such as waste quality & climatic conditions	Fluff / Pellets can be used a fuel in large industries, e.g. In cement kilns with necessary permissions from the PCBs and required pollution control measures.	The technology requires pre-segregated homogenous biodegradable waste as mixed waste retards efficiency of the process. Hence applicability is limited to highly organic and homogenous waste streams like market wastes.	Requires waste with high calorific value. Expensive flue gas remediation methods to attain achievable outputs.	Expensive technology, waste criteria must have low moisture content and high calorific value, which is not found in Indian Waste. Costly flue gas remediation methods to attain achievable outputs.

Source: Toolkit for Solid Waste Management Jawaharlal Nehru National Urban Renewal Mission, 2010 MoUD.

Waste after treatment must be disposed of in a manner that does not create any instance of environmental pollution and public nuisance. The MSW Rules, 2000 defines waste disposal as an activity which involves "final disposal of municipal solid wastes in terms of the specified measures to prevent contamination of ground-water, surface water and ambient air quality".

The landfill design shall aim to minimize the following:

- The ingress of water into the landfill,
- The production of leachate, its subsequent outflow and uncontrolled dispersions into surrounding aquatic environment,
- The accumulation, migration and uncontrolled release of landfill gas into the atmosphere.

Materials Recovery Facility

A Materials Recovery Facility at the solid waste dump site can take in source-separated recyclables, such as newspapers, plastics, metals and bottles and recycle these. However, these materials which cannot be recycled, like dirty paper can be used to produce electricity, fertiliser and soil amendment products instead of going to landfill.

Conventionally, it has been cost prohibitive to produce large quantities of fertiliser and soil amendment products from the waste. This problem can be addressed by process integration with the solid waste treatment infrastructure. The green waste is sterilised, separated, shredded, pelletised and dried. Ash and grit fractions from the treatment process can be added to the product to enhance mineral content and improve drainage. The process yields a premium mulch product with commercial applications and is free of pathogens, parasites and fugitive seeds.

Waste Recycling and Segregation

Recycling of waste can be effectively achieved by segregation at the source, reducing the waste by more than 50 per cent. The waste can be converted into a reusable commodity through advance processes at the recycling centres. Recycling services require segregation of waste materials into different types. The pyramid of most desirable option begins with reducing waste and then proceeds to reuse, recycle and recover. Disposal of waste in landfill is least desirable option.

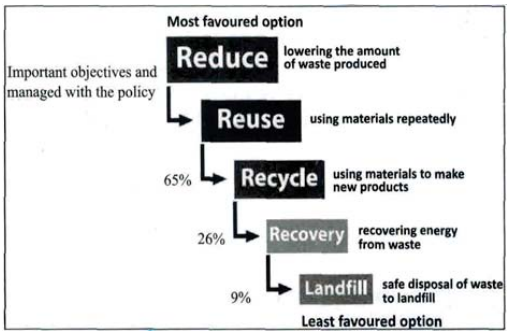


Fig. 3: Danish Waste Hierarchy: 65 per cent waste is recycled, 26 per cent is incinerated and 9 per cent is landfilled. Incineration does not count as recycling.

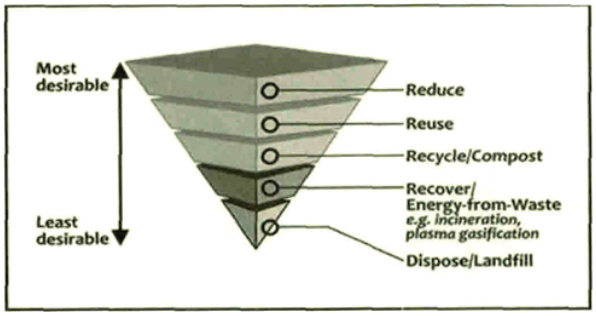


Fig. 4: Inverted Pyramid of Waste Management

Source: Ottawa.ca

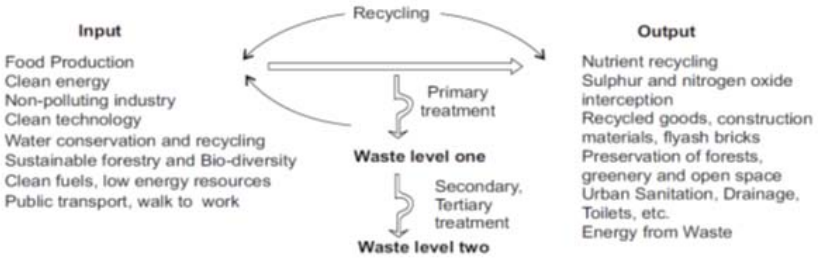


Fig. 5: Circular Metabolism

Managing Waste-Japanese Model

The local municipality in Japan has invoked strict laws to keep the city clean, which ensures that there is no garbage on the roads.

Strict segregation laws: At household level, residents are required to segregate garbage into four types-combustible (kitchen waste), non-combustible (plastic), resources trash (newspapers, magazines) and large-sized trash (furniture, home appliances).

Garbage Collection: The municipal authorities have designated specific days in a week to collect different types of trash. For example, if the days specified for collecting non-combustible waste are Monday and Thursday, then residents would throw out only combustible waste on those days. To get rid of other trash, they would have to wait for the specified day.

Treating waste: Instead of dumping the waste directly into landfill sites, the waste is processed, treated and then dumped into a landfill.

Incineration: No fuel is used for burning the waste. Heat is generated by friction, the incineration unit has a sand bed through which air is passed. The air causes the sand to whirl like boiling water and the garbage burns in the whirling sand at 600° celsius. Toxic gases produced are treated before being released in atmosphere.

Recycling: While non-combustible waste is directly sent for recycling, in case of bulk waste, valuable resources like iron are separated (using a magnetic belt, etc) and compressed and then sent for industrial reuse.

e-waste: There are separate laws for electronic waste. In case of computers, refrigerators, washing machines and TV sets, the manufacturing company collects the appliance from the user and sends it for recycling. The customer has to shell out a recycling fee whenever he disposes of an old electronic appliance. The chlorofluorocarbon (CFC) gases from refrigerators and ACs are neutralised before being disposed of.

Source: *Hindustan Times, July 24, 2006*

Waste to Energy (W2E)

By adopting scientific methods, energy can be recovered from waste. As the organic matter decays it produces biogas, known as landfill gas (LFG), landfills have to be managed so that the LFG does not pose a threat to the surroundings. Rather than discharging it to the atmosphere, LFG can be recovered for providing a useful energy. Indian municipal waste has a potential to generate 150-250 cum of biogas/LFG per ton depending upon the quality of wastes. By employing a set of generator and transformer, bio-gas can be converted in electrical energy.

The task force of the Planning Commission headed by K. Kasturirangan proposed a target of setting up 215 Waste to Energy plants by 2031 that will generate 1,075 MW of power and setting these through public-private partnerships (PPPs) with viability gap funding of up to 40 percent. The report stresses for an integrated approach towards municipal solid waste management, and the need for segregation of waste at source with private sector help. Since the urban local bodies (ULBs) lack the financial and institutional capacity necessary for integrated management of municipal solid waste, which requires investments, especially for 'Waste to

Energy' projects, the report suggests to transfer the commercial risks to the private sector in order to ensure an efficient system for collection, transportation and processing of waste for generation of electricity. It is proposed that 'Waste to Energy' projects can be set up in cities with population above two million, generating more than 300 tonnes per day or more of combustible waste.

The report proposes exemption from corporate income-tax for the first five years, immediate refund of value-added tax and a feed-in tariff, which means higher price for waste management and energy, among other things.

As a pilot project, the Delhi Energy Development Authority since 1986 has been extracting gas from a sanitary landfill in Timarpur. Eight wells were bored into this 80 acre dump, 20 to 35 feet deep, which have been yielding 33 cubic feet of gas a minute. This can be used either for cooking or to power a 30 KVA generator, using diesel or a mixture of diesel and gas as fuel. The gas, similar to bio-gas, is 55 to 60 percent methane, with a calorific value of 550 British Thermal Units and is supplied to 20 outlets in Balak Ram Hospital twice a day for six hours. The gas has not been used to generate electricity over a length of time though the provision is there and the necessary electrical connections to the hospital have been made. The generator consumes six litres of fuel an hour but when mixed with gas a saving of 4.5 litre of the fuel is affected. To extract the gas, a four inch diameter perforated pipe is sunk. Another perforated pipe, two inches in diameter, is lowered into it and the surrounding area is filled with bricks to prevent decaying matter from clogging the pores.

In Delhi new W2E plants have invited strong opposition from the neighbouring localities due to pollution, soot, odour and garbage processing. This needs improvement in plant technology and waste transport, as well as locating such plants outside the residential zone.

Jindal Ecopolis, which is operating the new plant in Okhla, claims to be using better technology but the problem remains that waste is not segregated. The Okhla plant is in the middle of a residential area, which has been inviting stiff resistance from the residents, who suspect that the plant is burning everything, from plastic to chemicals and for 16MW of power, it is too high a price to pay.

The Indian Renewable Energy Development Agency (IREDA) estimates suggest that the country has so far realised only about 2 percent of its waste-to-energy potential. A market analysis by Frost and Sullivan predicts

that the municipal solid waste-to-energy market could be growing at a compound annual growth rate (CAGR) of 0.7 percent in the near future.

Solid Waste Energy and Recycling Facility (SWERF)

A sustainable and feasible solution for the management of municipal solid waste is setting up a Solid Waste Energy and Recycling Facility (SWERF). SWERF reduces the need for future acquisition of land for landfills by 90 per cent. Odours and health risks are reduced as the SWERF is totally enclosed. There is sterilized handling of recyclables and rejects as the municipal solid waste is first processed in an autoclave. Greenhouse gases are reduced by efficient conversion technology. The SWERF system has the following features:

- Waste Reception, that includes the rag-pickers in the loop
- Autoclaving of waste
- Mechanical source separation of recyclables
- Organic pulp washing, drying and storage
- Gasification of organic pulp to create syngas
- Electricity generation from syngas

The technologies that are used by SWERF include:

- Split bin collection for municipal wastes.
- Sorting and processing technologies utilized in existing materials recovery facilities.
- Value adding process for glass, plastics, metals and paper, in which rag pickers have an important role.

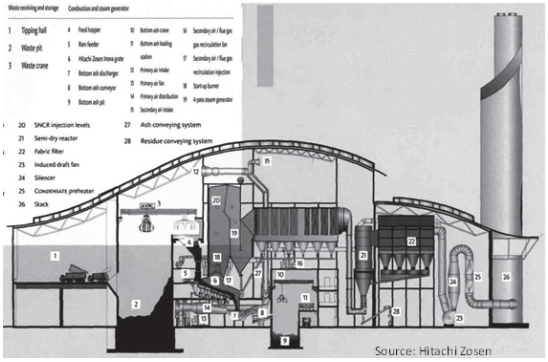


Fig. 6: Waste to Energy Plant

In Waste to Energy System, prior to the collection of solid waste, recyclables are sorted out and retrieved for processing. The solid waste that remains is then collected and sent to the various waste-to-energy plants for incineration. Incineration reduces the volume of solid waste by about 90% and produces steam that runs turbine generators to generate electricity. The incinerated ash and other non-incinerable wastes are then transported to the Transfer Station plants. To prevent odours from escaping into the environment, the air in the refuse bunker is kept below atmospheric pressure. High-capacity rotary crushers reduce the size of bulky solid waste to improve its burning efficiency. The solid waste is then fed into the incinerator by a grab crane. As the incinerator is heated to temperatures between 8000C and 1,0000C, a lining of silicon carbide tiles protects the incinerator walls from the extreme heat and corrosion. Each load of solid waste is reduced to about 10% of its original volume in about five hours. Catalytic fabric filter systems and two-zone electrostatic precipitators remove pollutants from the flue gas before it is released from the plant while ash is collected, and the ferrous material is removed for recycling.

Energy can be also recovered from biodegradable and non-biodegradable waste through thermal, thermo-chemical, bio-chemical and electrochemical methods.

Thermal Conversion: The process involves thermal degradation of waste under high temperature and it is then that complete oxidation of the waste occurs. The major technological option under this category is incineration. But incineration has been losing attention because of its emission characteristics.

Thermo-chemical conversion: This process entails high temperature-driven decomposition of organic matter to produce either heat energy or fuel oil or gas. These are useful for wastes containing high percentage of organic non-biodegradable matter and low moisture content. The main technological options under this category include Pyrolysis and Gasification. The products of these processes (producer gas, exhaust gases, etc.) can be used as heat energy or further processed chemically to produce a range of end products.

Incineration Technology

Incineration is a process of controlled combustion of solid wastes and residue. During combustion moisture is vaporised whereas the combustible portion produces heat carbon dioxide, water vapour, ash and non-combustibles are the end products. The heat generated during incineration is recovered and utilised for the production of steam, heating water, and generating electricity. Incineration

technology is economical for the treatment of large quantities of solid wastes by thermal process. This type of refuse includes not only metals and laminates but also untreated domestic wastes.

Pyrolysis/Gasification Technology

In this process segregated combustible matter is allowed for drying and thereafter it is shredded in a hammer mill. The combustion/ pyrolysis of shredded matter takes place in a fluidised bed reactor without any fuel support. The end product includes combustible "producer" gas, which can be utilised for production of power. The heat produced in the process can also be employed for production of steam and ultimately generating power. Although not fully competitive with conventional electricity at today's energy prices, extracting energy from wastes offers environmental benefits, helping to reduce fossil fuel consumption and, amongst other things, the problem of methane emissions from landfill sites.

Landfill Gas Extraction (LFG)

The waste deposited in a landfill gets subjected, over a period of time, to anaerobic conditions. This leads to landfill gas production containing about 45-55% methane. This methane can be recovered through a network of pipes and utilised as a source of energy. Landfill gas extraction system adds to efforts to reduce Climate Change initiatives as it helps reduce Green House Gas emissions through avoidance of landfill gas (mainly comprising of methane) into the atmosphere.

Waste composition is the most important factor in assessing the LFG generation potential and total yield at a site. Inorganic and inert wastes will produce little or no LFG; more organic wastes will produce greater amounts of LFG on a per unit basis. Similarly, moisture content in waste also impacts the LFG generation from waste. For e.g. highly organic wastes such as food wastes are able to produce LFG, but comprises large water, which inherently does not produce LFG but will aid the rate of LFG evolution.

While planning for LFG, pH and Nutrient content of the waste should also be considered. The generation of methane in landfills is greatest when neutral pH conditions exist. Numerous toxic materials, such as heavy metals, can retard bacterial growth in portions of a site and consequently slow gas generation. Another parameter that influences the LFG generation rate is the particle size and density, which may affect the transport of nutrients and moisture throughout the landfill.

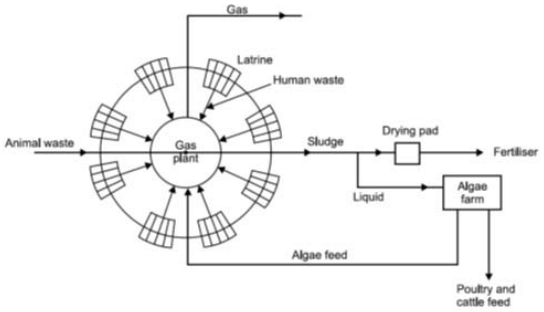


Fig. 7: Bio-gas generation from human and animal waste

Bio-chemical conversion: This process is based on enzymatic decomposition of organic matter by microbial action to produce methane gas, and alcohol, etc. This process is preferred for wastes having high percentage of organic, bio-degradable (putrescible) matter and high level of moisture/water content, which aids microbial activity. The major technological options under this category are anaerobic digestion (bio-methanation) and fermentation. Of the two, anaerobic digestion is the most frequently used method for waste to energy generation, while fermentation is still emerging.

Electrochemical conversion: Electrochemical conversion in the context of waste to energy refers typically to microbial fuel cells (MFC). These systems are developed to trap energy from wastes, where the reduction-oxidation machinery of immobilised microbial cells is catalytically exploited for the accelerated transfer of electrons from organic wastes to generate electricity and bio-hydrogen gas. However, this methodology needs extensive evaluation studies on bulk scale waste treatments and stands at a nascent level in India as well as worldwide.

In this process, organic matter of solid waste is segregated and thereafter it is fed directly into a bioreactor, where in presence of methanogenic bacteria, and under an aerobic condition, the fermentation takes place and biogas is produced. In addition, a high quality organic manure is also produced. Energy can be recovered by digesting certain organic wastes and recovering the methane rich bio-gas which provides heat and electricity.

Fuel-Pellets

Municipal Solid Waste (MSW) comprises various materials such as paper, plastics, glass, metals, vegetable matter, rags, rubber, etc. It is essential

to segregate the organic materials from MSW in such a way that it is free of sand, moisture and other ferrous and non-ferrous materials. The segregated organic matter can be dried, ground and pelletised. This ground organic matter can be added by biomass to enrich calorific value of fuel pellets.

A pilot project of the Department of Science and Technology had been set up at Mumbai for producing about 80 tons per day of refuse derived fuel pellets as a coal substitute. The palletisation technology from has been developed as an indigenous technology with pallets having a calorific value of 3500 Kcal/Kg, as a substitute of coal.

In Gujarat, Vadodara Municipal Corporation has taken up the production of petro-coal pellets. It is produced from combustible garbage plastic, dry leaves, discarded clothes and vegetable waste supplemented by oil or petro-waste available from oil refineries. The process that turns combustible garbage into petro-coal is similar to the natural process that yields ordinary coal from the mines. After dehydrating and pulverising the garbage, it is mixed with petro-waste. Palletisation makes the material dense and hard, ensuring that it burns slowly and uniformly. The fuel is about half the price of coal and emits lower levels of sulphur dioxide and carbon monoxide. The entrepreneurs have also taken up conversion of biomass like, paddy husk, straw, groundnut shell and other waste materials of low calorific value into briquetted fuel which is an efficient source of energy.

Composting Option

Incineration is an effective solution, but it is air-polluting and expensive for wastes having a high proportion of vegetable and putrescible matter. Economic constraints favour composting, as the city wastes contain a significant amount of nitrogen, phosphate and potash, as well as organic soil supplements.

A study by NEERI of 33 cities of India indicates that waste contains moisture varying from 10 to 40%, non-combustible materials or ash 50 to 80%, and volatile or combustible material only 10 to 25%. Modern day garbage also contains a large amount of various non-recyclables, viz. wax paper, silver printed packets, Tatra-packs, foamy plastic, cigarette foil, soft squeeze tubes, sachets, cellophane paper and thermocol. Thus, incineration is not always a viable and practical process to dispose and treat the waste. Another common problem is mixing of MSW with sewerage. In absence of sanitation and sewerage facilities in many areas, especially in inner city, village, squatter settlements and slums, night soil and sludge get discharged in the river, local drains, ponds, garbage dumps or streams. In Delhi, it is assessed that the

BOD load of river Yamuna is as high as 1,50,000 Kg per day. High quantities of sludge endanger the soil and sub-soil water by percolation of the pollution. This calls for adoption of simple and economical processes, like composting.

In spite of its simplicity and relative cost advantage, composting has remained a challenge. Commercial viability has so far been elusive except occasional reports. The MSW Rules of 2000 stipulate stringent quality requirement, especially in terms of minimum concentration of eight metals—As, Cd, Cr, Cu, Pb, Hg, Ni and Zn. However, for bio-degradable matter composting is one of the most popular system of garbage disposal. Apart from saving land, valuable products like compost, biogas, heat, electrical power, recycled paper, plastics, glass, metals, etc. are obtained. Composting can be done in different ways:

- Aerobic window composting
- Anaerobic trench composting
- Vermi-composting
- In-vessel aerobic composting

Effective Micro-organisms

Effective Micro-organisms (EM) is a combination of various beneficial, naturally-occurring micro-organisms mostly used for a found in foods. It contains beneficial organisms of 3 main kinds—phototrophic bacteria, lactic acid bacteria and yeast. These effective micro-organisms secrete beneficial substances such as vitamins, organic acids, chelated minerals and anti-oxidants when in contact with organic matter. They change soil micro-flora and fauna so that disease-inducing soil becomes disease-suppressing soil which in turn has the capability to develop into a zymogene soil. The anti-oxidation effects of these micro-organisms pass directly to the soil or indirectly to plants maintaining their NPK and CN ratio. This process increases the humus content of the soil and is capable of sustaining high-quality food production.

Effective micro-organisms were developed in liquid form by Dr. Teruo Higa, University of the Ryukyus, in

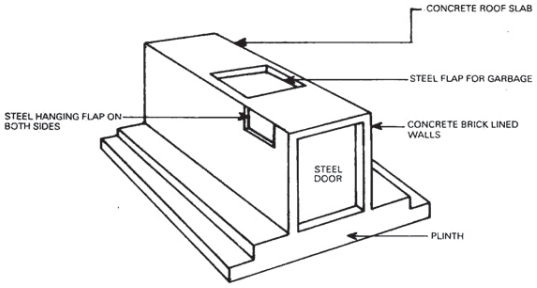


Fig.8: Bio Reactor Waste Composting

1982. At first, EM was considered an alternative for agricultural chemicals, but its use has now spread to applications in environmental, industrial and health fields.

Vermi-composting

Composting of biodegradable waste by earthworms, including human excreta, is gaining popularity. Organic waste is allowed to be decomposed by micro-organisms already present in the waste. The process can be accomplished either in presence or in absence of oxygen known as aerobic or decomposition respectively. During aerobic decomposition, organic compound gets oxidized to oxides of carbon and nitrogen and temperature of the mass rises to 70^0 C.

The destruction of common pathogens and parasites takes place during this period. The methane. Absence of oxygen during the process generates methane in addition to other gases. The mixture of methane and carbon dioxide is known as biogas which is a useful source of energy. This process requires controlled environment and closed reactor to reduce odour problem, eliminate flies and for effective collection of gas.

In vermin-composting earthworm species are used for the conversion of organic waste into compost. Selection of appropriate species of earthworms for vermin-composting in India is limited to a few. The best choice for vermi-composting is two species, i.e. Eudrilus eugeniae and Eisenia fetida. Eudrilus eugeniae, popularly known as African Night Crawler is found to be the best for vermi-composting. It has excellent growth and high conversion ratio.

Earthworms degrade the organic waste by both physical and chemical breakdown in their gut. The gut of an earthworm acts as a bio-reactor providing ideal conditions for temperature. PH and oxygen concentration for speedy growth of aerobic bacteria which outcompete pathogens resulting in pathogens destruction. These micro-organisms produce useful compounds like antibiotics, vitamins and plant growth hormones. Worms use about 5 to 10 per cent of the organic material for their growth and excrete the rest in the form of granular cast which is known as vermin-compost. The granular loose vermin-cast provides oxygen rich, nutrient rich media for aerobic microbes which further accelerate decomposition process. About 2,000 worms are required for a volume of Ix 1x0.5 m. On an average, 5 kg of waste is partially digested by 1,000 worms in a day.

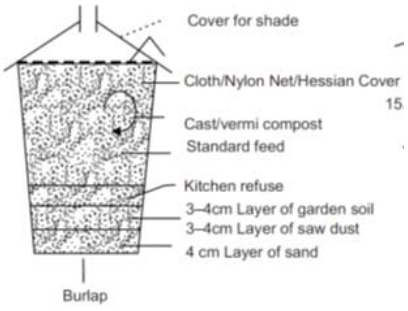
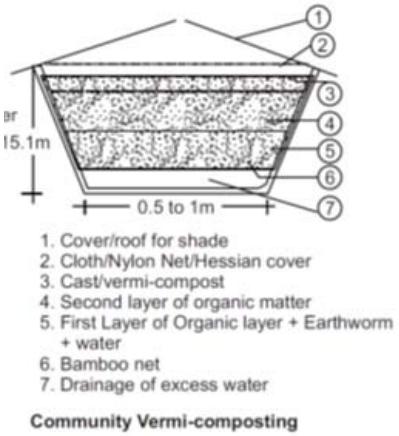


Fig. 9: Vermi-Composting for domestic waste



Fig; 10; Vermi -composting for large volumes

Pneumatic Waste Collection

Garbage transportation is the one of the largest overheads of local bodies. The current system which uses waste-hauling trucks is very costly compared to the operating cost of mechanized system. Disadvantage of current system include unsightly, unhygienic landfill sites, bins, transportation, truck maintenance cost, labour cost and the noise and pollution. To obviate these problems, pneumatic waste collection can be adopted. It consists of an integrated collection station, piping system and discharge valves that are situated below vertical chutes outside the residential, commercial and other areas. Waste of one type is collected into the garbage chute, where it is stored above a garbage valve between the emptying cycles. There is a main pipe network under the valve that connects all valves and transports the waste to the collection station. These systems work best in a radius of about a kilometre. The new colonies and urban extension can be pre-planned with pneumatic waste ducts, gravity, chutes and underground waste storage facilities

Pneumatic waste collection offers a cleaner solution that can alleviate traffic congestion and encourage recycling. It also would improve the overall city hygiene, aesthetic, and landfill sites required, besides cost reduction in waste collection. The processing of garbage is mostly underground at local collection stations. Fewer garbage trucks lead to a reduction in CO_2 emission, traffic noise pollution and reduced haulage costs.

Pneumatic Solid Waste Management has been implemented at several places, including Mecca at and

Holy City's Grand Mosque. Vacuum conveying technology specialist Mari-Matic has supplied a waste collection system to deal with the massive waste management challenge facing this city. Completed in 2013, Mari-Matic's Metro Taifun System in Mecca automatically conveys 900 tonnes of solid waste per day during peak season, i.e. the annual Hajj pilgrimage. Waste bags are fed into gravity chute intakes linked to a network of 30 km of pipelines running beneath the grand mosque complex. Transporting waste through airtight pipelines instead of using trucks minimizes problems of noise, smell and dust. Waste is conveyed through the pipelines to a collection terminal well away from the mosque. At the terminals the waste is compacted into containers for transportation by truck to a recycling and landfill site. The system uses much less energy than trucks or conventional automatic waste collection systems.

Bio-reactor Landfill

Disposal of waste in bioreactors is an innovative solution that represents a new step in the reduction of the impact on the environment in the critical area of waste management.

Increasingly efficient techniques combine physical, chemical, biological and concentration processes to obtain purified leachates that can be disposed of in the natural environment. After capture, bio-gases are normally burned in flares, which prevents the atmospheric emission of methane which has a greenhouse gas impact that is 21 times greater than that of CO_2. There is also an increasing number of projects that make use of biogas in either electricity or heating networks.

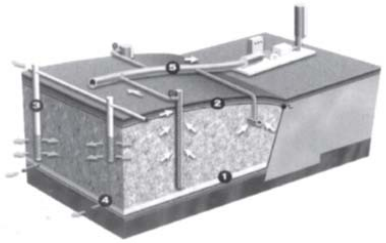
The bio-reactor landfill disposal involves control over degradation, with attempts to accelerate the process so as to rapidly stabilize the volume of waste. A bio-reactor is a chamber in which the waste degradation process is accelerated by re-injection of the leachates. This helps to control humidity, a critical parameter in degradation, and create optimal conditions for the development of bacteria.

Re-injection of leachates helps to bring about stabilization of the waste in less than ten years or so, whereas at least 20 to 30 years are needed in the case of disposal in conventional cells. The main advantages expected from bio-reactor processing include:

- The reduction of long-term environmental risks by more rapid stabilization of waste, since the performance of sealing systems can deteriorate over time;

- Reduced biogas leakage, thanks to a surface geo-membrane which ensures that disposal cells are leak tight. This results in a reduction in foul odors and greenhouse gas emissions;

- An increase in the number of sites capable of making use of energy conversion, as bio-reactors increase the volume of captured gases.



- The floor and walls of bio-reactor cells use the same sealing systems as conventional cells.
- They are covered with a hermetic geomembrane, which means no biogases are lost.
- Vertical pipes inject leachates that humidify the entire volume of waste.
- The re-injected leachates are then recovered at the bottom of the cell, then purified in the site's processing station.
- Suction piping then captures the biogas and routes it to the flare where it is disposed of.

Fig. 11: A Bio-reactor

Source: ADEME, 2006

Ecological sustainability is ensured by geological and hydro-geological studies prior to the project, the distancing of the site from populated areas, very strict technical specifications such as, increased leak tightness of disposal cells using geomembranes on the bottom and sides of the disposal cells to capture and processing of leachates and biogases.

Management Reforms

The solid waste management has the following stages: (a) waste generation and storage, (b) waste collection, (c) waste transfer/ transportation, (d) treatment, recycle and recovery, and (e) disposal. Promoting alternative approaches in solid waste management need municipal reforms, change in attitude (particularly towards rag pickers), capacity development and a partnership approach involving the private and community sectors. Suitable mechanisms need to be evolved to overcome the barriers in promotion, development and dissemination of new approaches to waste management. This requires proper coordination and dovetailing of the resources of the government/local bodies, development authorities, NGOs, RWAs, industry, cooperatives and private sector. A clue can be taken from the British Local Authority Act, whereby the concept of 'Compulsory and Competitive Tendering', the monopoly of local bodies in the solid waste management and other services has been disbanded and they have to compete with the private sector. Indian cities can learn from such success stories and incorporate suitable legal, managerial

and financing reforms that will bring investments, together with new, smart technology and operational efficiencies.

Integrated planning and management should include, maintenance and replacement of machinery, equipment and vehicles, manpower training and research, identification of appropriate sites for the dustbins, transfer stations, waste to energy sites, compost plants, incinerators, workshops, etc. The operational planning involves planning and development of gravity chutes, pneumatic ducts, route optimisation for transportation of waste; marketing of bye-products, and effective involvement of rag pickers, community groups and resident welfare associations. Regular analysis of waste characteristics on seasonal basis both in terms of quantity and constituents, may help in improved SW management. Preparation of Waste Management Plans in consultation with the inter-connected agencies would help in synergizing the efforts and improving overall performance.

There are successful examples of public-private partnerships in different cities in India and abroad that could be examined for adoption at different stages of the entire operation. Substantial reduction in cost of waste management and improvement in services can be achieved by adopting innovative and alternative techniques of waste management.

Institutional Arrangements

The Yes Bank Business Council for Sustainable Development in its report E-Waste Management has proposed that the institutional framework may be centered on the concept of Producer Responsibility Organization (PRO), an entity which is intended to have the physical responsibility for the waste recycling mechanism by providing forward and backward linkages with all other actors involved in the process. Such PROs have been formed as third party organizations to manage and collect the end-of-life products in lieu of each producer establishing its own separate system.

The Ministry of Urban Development in its Atal Mission for Rejuvenation and Urban Transformation (AMRUT, 2015) have also recommended establishment of dedicated Special Purpose Vehicle within the urban local body for integrated, efficient and professional management of urban waste. The model requires integration of activities between the informal and formal sectors, thereby bringing them into the mainstream of waste management activity.

Through dovetailing the informal sector with mainstream recycling units, it is envisaged that the informal sector will serve as a feeder system for the

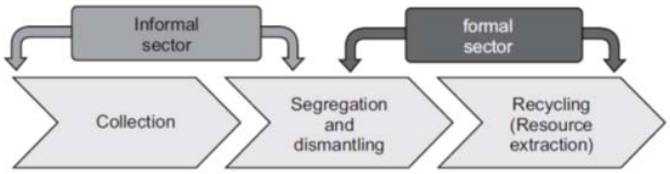


Fig. 12 : Integration of Informal Sector in Managing Waste

Source: Adapted from GIZ, 2010

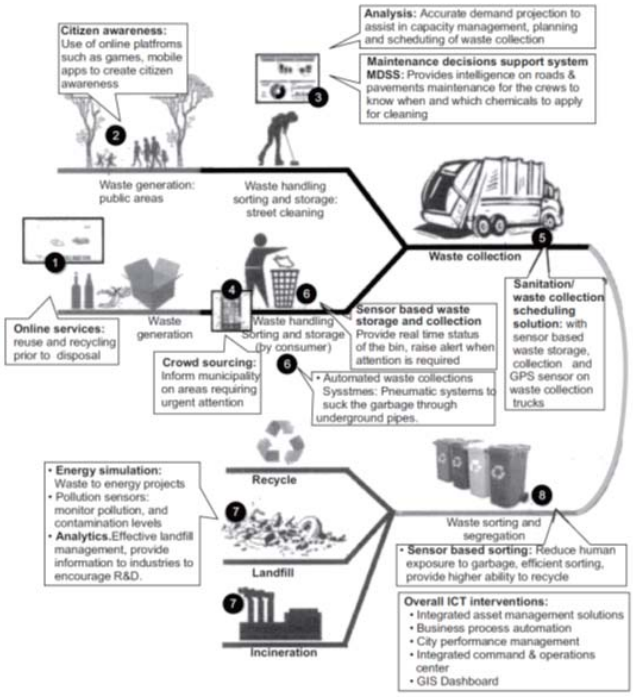


Fig. 13: Smart Solid Waste Management

Source: NASSCOM (2015). Integrated ICT and Geospatial Technologies, New Delhi

formal recycling industries. While the informal sector carries out dismantling activities in a controlled manner, it is imperative that operational standards are prescribed to ensure that a mix of manual and mechanical operations. A monitoring mechanism should also be put in place so that all operations are environmentally sound and safe for the workers.

Smart Solutions

Technology plays an important role by providing smart, performance based and efficient solutions for digital planning, sanitation, sewerage and garbage collection, resource optimisation, asset management, maintenance, pollution controls, air quality measurements, etc. There is a need to redefine the waste management processes based on circular economy concept, which aim to reduce impact on environment and leverage waste to generate value. Technology can also help involving citizens in waste management and monitoring by using mobile and web channels.

The following ICT enablers can be invoked for Solid Waste Management:

- **Online platforms:** Online platforms provide options and alternatives to the user to look into reusing old stuff. The existing user is also encouraged to look for options to sell and regain value from the product before discarding the product as waste.
- **Analytics:** Accurate projections on total waste generated, waste type and identification of high waste generation areas enable effective planning and management of solid waste, management services. Use of analytics during events with large citizen involvement such as festivals and fairs can ensure smooth collection and transport of waste.
- **Crowd-sourcing:** Citizens can be encouraged to report waste-related activities which need urgent attention from the authorities.
- **Sensor-based waste collection:** Sensor-based waste bins to identify status of waste bins if it is empty or filled so as to customise the waste collection schedule accordingly and save costs.
- **Automated waste collection system:** Automated Waste Collection System (ACS) is a long-term solution and can take care the conventional methods like door-to-door, curb-side, block, community bins collection and transportation via chute system from high rise buildings with waste sucked though pipes and minimal human intervention.
- **GPS devices and sensors on waste truck:** GPS technology to route the waste collection trucks can optimise the collection efficiency and ensure contractors dump waste at the designated places. It will also give a clear picture of waste generated per ward/locality.

- **Sensor-based sorting:** Sorting waste material with the use of sensor technology helps in smart sorting. The sensor technology can recognise materials based on their visible spectrum or colour with infra-red/ultra-violet spectra or based on their specific and unique spectral properties of reflected light, or atomic density or conductivity/ permeability or atomic characteristics.

- **Pollution sensors:** Leverage the pollution sensors to gauge pollution levels at landfills/ waste storage and processing units..

- **Energy simulation (waste to energy):** Use of energy simulation software and analytics can provide accurate projections of waste generation and energy production from waste.

- **Analytics-based landfill management:** Accurate waste generation and collection. projections along-with break-up of type of waste can enable smart landfill management.

- **Integrated asset management solutions:** Integrated asset management of all waste. infrastructure assets including the associated data, processes, information systems and governance for manageable operations and higher sustainability.

- **Business process automation:** Re-engineer, optimise and automate business processes using business process management solution to have a fully integrated and policy-driven set of automated business processes that increase efficiency and reduce service delivery costs.

- **Workforce and resource management:** Leverage the workforce and resource management solutions to improve workforce engagement and task management. Optimise the workforce with the help of management solutions like planning, forecasting and scheduling, shift management, mobile applications to execute tasks and efficient performance management tools.

- **City performance management:** Monitor the performance of waste management subsystems through the digital technologies and big data analytics.

- **Integrated command and operations centre:** Leverage integrated command and operations center to monitor city services on real-time. Improve/ synchronise maintenance activities to reduce downtime.

- **Geospatial dashboard:** Bin locations, landfill locations, waste management assets can be mapped by geospatial system.

Conclusions

The endeavour to make human settlements cleaner, hygienic and environmentally sustainable and smart, requires changes in the conventional practice of solid waste management which by and large depends upon its dumping in landfill sites. The paper highlights various alternatives to landfill sites and emphasises the need to segregate, reduce and recycle the wastes. Smart solutions, IT and sensor-based processes can help in making SWM efficient, sustainable and decentralised.

References

1. AIILSG, (2014) Urban Update, Cleaner Tomorrow, May, Mumbai.
2. Assocham, Waste to Wealth, Undated, New Delhi.
3. Assocham & C-kinetics (2015) Value Out of Waste (VOW), New Delhi.
4. Centre for Science and Environment, (2012) Excreta Matters, 71 Cities Survey, CSE, New Delhi.
5. CPCB, Status of Municipal Solid Waste Generation. Collection, Treatment and Disposal in Class II Towns.
6. CPWD (2014), Guidelines on Reuse and Recycling of Construction and Demolition Waste.
7. CSE (Centre for Science & Environment), India-Environment Report, New Delhi.
8. Government of India (2014) Guidelines for Developing State Policies on Solid and Liquid Waste Management (SLWM) in Rural Areas, Ministry of Drinking Water and Resources, New Delhi
9. Hoornweg, D.P. Bhada-Tataand C. Kennedy (2013) Waste Production Must Peak this Country, Nature, Vol. 502, ,pp 615-617
10. IL&FS ECOSMART, 'Construction & Demolition (C&D) Waste; collection, transportation and disposal system', Project Report for MCD, Delhi Solid Waste Management Program, 38p.
11 Jain, A.K. (2016), Towards Cleaner and Hygienic Cities and Villages, Discovery Publishers, New Delhi.

12. MoUD, (2010), Handbook of Service Level Benchmarking, New Delhi.

13. MOUD, CPHEEO, Status of Municipal Solid Waste Generation, Collection, Treatment and Disposal in Metropolitan Cities. CPHEEO website. http://cpheeo.nic.in/

14. MONRE, Technical Memorandum on Waste to Energy Technologies, National Mission Plan on Waste to Energy, Ministry of New and Renewable Energy, Government of India.

15. NASSCOM (2015). Integrated ICT and Geospatial Technologies, New Delhi

16 World Bank, (2006) India Water Supply and Sanitation: Bridging the Gap between Infrastructure and Service. Background Paper, Urban Water Supply and Sanitation.

17. Yes Bank, Teri & Business Council for Sustainable Development (2014) E-Waste Management in India, New Delhi.

❐ ❐ ❐

Empowering Marginalized Communities including SC and ST in PRIs

T. Brahmanandam

Empowerment

Empowerment remains to be a multi-faceted concept, and used in different contexts to denote different kinds of social and psychological connotations. In its much wider connotation, the concept has been defined as 'the expansion of people's capabilities and choices, the ability to exercise choice based on freedom from hunger, want and deprivation; and the opportunity to participate in, or endorse, decisions that affect their lives'. The idea of empowerment is invoked in many contexts like human rights, economic insecurity, disadvantaged groups and their capacity building as well as in addressing the problems of basic human rights. Empowerment involves two important aspects: developing the capabilities, negotiating skills and the ability of people on the one hand and obtaining authority to make decisions or participate in decision making on affairs that affect their lives on the other. As Jo Rowlands says, 'it is about the individuals being able to maximize utility and use the opportunities available to them without or despite constraints of structure and state'. Theoretically, empowerment is a process that helps people to gain control over their lives through raising awareness, taking action and working in order to exercise greater control.

Empowerment necessarily demands political inclusion in the institutions of decision-making and change in the existing power relations where certain sections of society remain outside the decision-making process owing to their specific historical socio-cultural experiences. In a democratic political structure, empowerment, therefore, entails proper and effective representation in the institution of governance, so that people can voice their concerns and participate in decision making on matters that affect their lives.

Political representation of marginalised or excluded groups in the institutions of governance will provide them with substantial power to change the rules of the game and also to negotiate the power relations with the privileged sections of society. Political empowerment is also regarded as political incorporation (inclusion) to the extent in which a group has had significant representation and influence in political decision-making.

Marginalised Sections

India has a population of 1.3 billion, and even with an average economic growth rate of 6-7 percent per annum, almost one fourth of its population still lives in poverty. Seven out of every ten Indians still live in rural areas. The economic condition of a poor is inextricably intertwined with the social dimensions of his well-being, equity and social rights. The vulnerable and marginalized groups in India are not distinct and easily identifiable. The social fabric is ethnically diverse, socially stratified and heterogeneous in composition. With low literacy, abject poverty, complex social-ethnic environment, the poor and the vulnerable are mired with historical suppressions and subordinations over the generations.

The traditional caste system is still prevalent and it determines the social position of an individual based on birth and heredity in Hindu society, not allowing social mobility across the caste hierarchy and different lower castes (and classes) from all forms of social life. The lower castes and tribal groups remain at the bottom of social-economic hierarchy and in abject poverty. These lower castes and classes, often referred as the "Backward Castes and Classes", are generally the poorest among the rural population and are still victims of discrimination despite prevailing laws in India. For instance, the Dalits, or the untouchables are the worst victims of this caste discrimination followed by the Adivasis who are outside the caste hierarchy. The Adivasis mostly inhabit forest areas. They are categorized as the Scheduled Castes (SCs) and Scheduled Tribes (STs) as defined in the Constitution of India. The Constitution provides protective and preferential treatment to these groups, including the right to be treated equally and affirmative action in the form of reservations in educational institutions and public sector. It also prohibits any practice of untouchability i.e. discriminating or excluding individuals from social interaction in public place or even physical contact against these groups. In spite of that, discrimination and marginalization still persists in the form of atrocities like the Bathani Tola massacre in Bihar in 1996 or Kherlanji massacre of 2006 in Maharashtra, gruesome reminders of discrimination and atrocities still committed on Dalits. But even in the less violent spheres of

economic and social lives, participation of the marginalized groups in Panchayati Raj System is dismal because of pressures and restrictions. Their access to political participation depends on their economic and political relations with the dominant social class. Even in leadership positions, lower caste and tribal people, particularly Dalit women representatives, face harassment and obstructions to work. Pressures and restrictions on political participation also persist.

Historical Background of Panchayati Raj

In a multi-layered system of governance, local self-government is the lowest form of government, and it is closest to the people because its decision-making process is much more concerned to the people. The panchayats are believed to be traditional institutions. They are both in the north and south India and had been the pivot of administration, and the centre of social life and above all a focus of social solidarity. It became a representative institution during the colonial period.

The task of strengthening Panchayati Raj system fell on the Indian government after independence. To strengthen democracy, villages had to be strengthened because India happened to be a country of village panchayats. Mahatma Gandhi strongly believed in Grama Swaraj. According to him, the villages should be governed by themselves through elected panchayats to become self-sufficient. But surprisingly, they were not included in the draft Constitution. Due to Gandhi's intervention, it was included in Article 40 of the Directive Principles of the State Policy.

In the beginning, they failed to generate popular interest and enthusiasm. To bring enthusiasm in panchayats, the Planning Commission appointed a study team headed by Balwantrai Mehta in 1956. The committee had recommended that 'only grassroot level agency could establish a link between local leadership and the local people' and it recommended three-tier Panchayat Raj Institutions (PRIs) in the country.

By mid 1960s, Panchayati Raj had reached all parts of the country and the people felt that there was a system which could address their issues at local level. However, within two years of its reach, it failed to strengthen further. The experts expressed their apprehension as to the constitutional clarity, and most of the PRIs functioned as government's agent rather than self-governing institution. According to Mathur, these institutions were not seen as institutions of people's participation that played a role in deepening democracy, but rather seen as instruments to facilitate the implementation of national policies. Even the Janata government of 1977 has tried to strengthen PRIs.

73rd Constitutional Amendment

In September 1991, P. V Narasimha Rao, the then Prime Minister had introduced the Panchayati Raj Bill, and later it was passed in 1992 as the 73rd Constitutional Amendment Act with minor modifications and came into force on 24th April 1993. The significant feature of this act is that it gave Constitutional status to Panchayati Raj Institutions, and it became mandatory for all the state governments to implement this act. This Amendment brought uniformity in structure, composition, powers and functions of PRIs. It gave impetus to Panchayati Raj to promote social and economic development and improvement in living conditions of rural India. The creation of Panchayati Raj is perhaps the best transformation in democratic India to realise the participation of ordinary people in power sharing.

The Act provided a three-tier system of panchayat at village, intermediate and district levels. The Act says that there should be grama sabha in each village. A landmark feature of the act is that in all the panchayats, seats should be reserved for SCs and STs in proportion to their population and 1/3 of the total number of seats will be reserved for women. Reservation of seats and offices of the chairpersons for scheduled castes (SCs) and scheduled tribes (STs) in proportion to their population has the potential to bring radical change in the socio-political structure of this country. The reservation policy has given a chance to elect nearly 18.51 percent of SCs, 11.26 per cent for STs and 36.87 percent for women in all the 2, 39,582 panchayats in the country.

Marginalised Sections including SCs and STs in Panchayati Raj Institutions

At present, seventeen states are implementing 50 per cent reservation for women at all levels of Panchayati Raj.

According to Alok (2013–2014), there are 15 per cent of SCs, 19.28 per cent of STs and 43 per cent of women who are getting elected through mandatory reservation in 2,770,755 village panchayats across the country. This has brought about a virtual democratic revolution with more than 50 lakh representatives getting elected at local level every five years; out of which 13 lakh are women and more than 5.5 lakh are Dalits. Within the 5.5 lakh, the Dalit women are also getting elected as presidents and ward members. **(For details, see Table 1)**.

It's an important planning approach regarding minimizing the traditional feeling about the SC and STs in our society, particularly in terms of keeping them away from society. With new generation of Panchayats starting to function several issues have come to the fore which have a bearing on human

Table 1: Representation of Weaker Sections and Women in Panchayats (as on 1 April 2014)

Sl. No.	State	Women Representatives		SC Representatives		ST Representatives		Total (Including General)
		Number	Reservation (%)	Number	Reservation (%)	Number	Reservation (%)	Number
1	Andhra Pradesh	129028	50.0	48720	18.88	23610	9.2	257,055
2	Arunachal Pradesh	3889	33.0	NA	NA	9372	99	9,372
3	Assam	9903	50.0	1344	4.66	886	3.6	26,844
4	Bihar	68066	50.0	22201	16.36	1053	0.8	136,130
5	Chhattisgarh	86538	50.0	19753	11.00	63864	32.0	158,776
6	Goa*	504	33.0	NA	NA	92	8.0	1,559
7	Gujarat	40015	33.0	8247	7.00	25967	14.0	120,048
8	Haryana	24876	33.3	14684	20.00	NA	NA	68,152
9	Himachal Pradesh	13947	52.6	7467	24.70	1299	6.6	27,832
10	Jammu & Kashmir	9905	33.0	2708	8	3723	11.0	33,847
11	Jharkhand	31157	50.0	5870	11.00	18136	34.1	53,207
12	Karnataka	41577	50.0	17723	18.46	10275	9.6	95,307
13	Kerala	9907	50.0	867	5.00	187	1.7	19,107
14	Madhya Pradesh	204111	50.0	60726	15.00	113642	27.5	203,221
15	Maharashtra	101569	50.0	22201	11.25	30236	14.1	396,918
16	Manipur	836	51.0	39	1.96	36	2.6	1,724
17	Odisha*	78482	50.0	16390	16.25	22240	22.1	100,863
18	Punjab	33484	33.0	30923	25.79	NA	NA	96,576
19	Rajasthan	60351	50.0	19542	17.20	15342	12.6	120,727
20	Sikkim	549	50.0	77	7.00	418	38.0	1,099
21	Tamil Nadu	40075	35.0	3027	024.00	1841	1.0	119,399
22	Tripura	2044	50.0	1508	27.11	309	5.1	5,676
23	Uttarakhand	34494	50.0	12230	19.80	2067	3.1	61,452
24	Uttar Pradesh*	309511	39.0	185159	24.0	NA	NA	773,980
25	West Benga	119762	50.0	17605	41.67	4168	14.3	58,865
	Union Territories							
26	Andaman & Nicobar *	289	33.8	NA	NA	NA	Na	876
27	Chandigarh	57	34.4	28	18.66	NA	Na	149
28	Dadra & Nagar Haveli	47	36.9	3	2.00	112	81.8	125
29	Daman & Diu*	41	33.0	4	1.00	16	11.0	111
30	Lakshadweep*	41	33.0	NA	NA	110	100	110
31	Puducherry *	370	36.2	239	21.00	NA	NA	1,021
	India	**1355425**	**43.00**	**546528**	**15.00**	**349001**	**19.28**	**2950128**

Source: Information submitted by State Governments (Measuring Devolution to Panchayats in India: A Comparison across States Empirical Assessment – 2013-14, Indian Institute of Public Administration)

Note: Meghalaya, Mizoram and Nagaland are excluded from the purview of 73rd Amendment Act of the Constitution. Note: NA: Data not available from given sources..a. : Not applicable, *: Data pertain to previous years.

rights. Scheduled Castes and Scheduled Tribes elected representatives are actively participating in decision-making and implementation of different pro-poor programmes at panchayat level. This can be noticed from different scholarly studies of both published and unpublished works in India. The SC elected representatives are giving much importance in the case of loan and credit for agriculture and animal husbandry related activities. They equally have concern in the matters of creating and maintaining facilities like roads, drinking water and streetlights in their localities. It is understood that SC leaders pay much priority to the developmental activities, which involve financial aspects that leads to benefits for their community. This has been noticed in Venkata Ravi and Sunder Raj study in Nellore district of Andhra Pradesh.

Article 243D also specifies the mandatory rotation, i.e., the structural constraints of reservation of seats among constituencies from one election to the next election in 3-tier Panchayati Raj system. Though the Act failed to provide second term to the contestants in the same constituency, it has helped the same group/ community to contest in neighbouring constituency under reservation. This is the real transformation of participatory democracy for the marginalized sections of the society.

The awareness level among the rural masses of Karnataka, Kerala, Tamil Nadu, Rajasthan and Sikkim has brought significant changes in the functioning of Gram Sabha and its decisions, and they are successfully implementing the decisions of the Gram Sabha. In this connection, Dwarakanath has cited an instance from Tamil Nadu Government, which has issued orders to conduct the Gram Sabha on 26 January, 15 August, 1 May and 2 October every year without fail. Another significant feature in Madhya Pradesh Panchayati Raj Act is that they should conduct more than sixteen Gram Sabha meetings annually. This is a good way of ensuring self-governance at the grassroots level.

Another interesting factor on women in Panchayati Raj is that political empowerment has enhanced their social status. It enabled them to participate in all matters connected with the society on an egalitarian basis. The panchayat membership has given better status to women in public sphere. They are invited to participate in all the social functions of the panchayat area. This can be observed from Padmanabha Bhat study in Udupi district.

The experience of functioning of the Panchayati Raj bodies over last two decades suggests that stability-cum-continuity is being achieved, including execution of civic functions. However,

many chairpersons and members of PR bodies feel deprived not because of their direct or indirect elections but lack of meaningful stake in local governance.

Factors Working against the Marginalized Sections

The states such as Andhra Pradesh, Haryana, Himachal Pradesh, Madhya Pradesh, Orissa, Chhattisgarh, Maharashtra and Rajasthan have also introduced the two-child norm as eligibility criteria for contesting elections. Though this norm goes against both men and women, it is more detrimental to women especially to the scheduled castes and scheduled tribe community because majority of the families follow the big and joint family norm.

The continued dominance of traditional/dominant groups in rural India and the constitutional provisions of 73rd Amendment have intensified the antagonistic or conflict ridden rural situations which result into, more often than not, the violations of human rights on mass scale including violence, bloodshed and loss of life. Widespread violence takes place before and after the panchayat elections in most of the states, and many seats were won without being contested. This shows that the tussle of power exists not only between state and panchayats, but also between the traditional dominant power structure and emerging new leadership from the marginalised groups at the grassroots. The dominant groups vehemently oppose the weaker sections, particularly scheduled castes and scheduled tribes, to exercise their constitutional rights by participating in the process of voting, campaigning, attending meetings, running for office, lobbying their own representatives, etc., independently. That is why, in the recent past, panchayat elections at many places in most of the states resulted into killing of the villagers particularly scheduled castes and scheduled tribes. Some of the noted instances are as follows:

The Frontline has reported that elections could not be held in four gram panchayats reserved for scheduled castes. It happened because the dominant caste people in these villages boycotted the elections and did not allow scheduled caste people to file nomination papers for different posts. In the areas where scheduled castes participated in the elections by defying the wishes of the dominant caste and filed nomination papers for different posts, they were humiliated and put in a terror situation. These apart, there have been cases of scheduled caste voters being prevented from voting in many panchayats and their houses and colonies were attacked to intimidate them. At some places, the dominant castes put up dummy scheduled caste candidates in the elections who can be easily manipulated and led to carry out their whims and fancies.

Conclusion

Empowerment is a democratic process, especially in participatory democracy. The working of democracy at the grass-roots level aims at devolution of power to the people at the receiving end. People have the right to elect and to be elected under the Representation of the People Act, 1951. In the parliamentary system, as we have, the government is formed from the body of elected representatives and remains accountable to the same body for the administration. Empowerment comes with accountability and makes democracy credible. The 73rd Constitutional Amendment has made the representative system of village panchayats broad based and egalitarian with the inclusion of women as well as SCs and STs by way or reservation. This has reversed the social exclusion process towards social inclusion. Over the years, the SCs and STs are becoming assertive enough to redefine democracy at their end.

References

1. Alok V.N: (2014). Measuring devolution to panchayats in India: A comparison across states empirical assessment—2013–14 (Sponsored by Ministry of Panchayati Raj, Government of India). New Delhi: Indian Institute Public Administration
2. Bhat, Padmanabha: Gender Quota and Panchayti Raj Institutions in India: A reflection, http://paperroom. ipsa.org/papers /paper_33276.pdf
3. Brahmanandam. T (2018): Review of the 73rd Constitutional Amendment: Issues and Challenges. Indian Journal of Public Administration, Vol. LIV (I), 2018, pp.103-121
4. Dwarakanath (2013): Grama Sabha: A milestone for sustainable development in rural India. Kurukshetra, 61(7), 6–7.
5. Patnaik, Pratyusna (2013): Does Political Representation Ensure Empowerment? Scheduled Tribes in Decentralised Local Governments of India, Journal of South Asian Development, Vol: 8(1) 27–60.
6. Mathew, George (2013): Panchaytis: Hope for Dalit Rights, https://www.livemint. com/Politics/h3ezCD61bYNu9m aggsfkjM/Panchayatshope- for-dalit-rights.html.
7. Mathur, K. (2013) :Panchayati Raj (p. 4). New Delhi: Oxford University Press
8. Ravi, Venkar and Raj,Sunder (2003): People's participation and Panchayati Raj System:

9. Viji, Nidhi (2013):Empowering the Marginalized: Mahatma Gandhi National Rural Employment Guarantee Act in India, Human Affairs 23, 91–104, 2013.

10. S. Viswanathan (2001):Some disturbing trends, Frontline, October 26: 34-35

❐ ❐ ❐

A Socio-Economic Profile of Zilla Parishad Members of Maharashtra

Ankush P Aware

Elections for Rural Local Self Governing bodies i.e. Zilla Parishad (ZP) and Panchayat Samiti (PS) were held in Maharashtra in February 2017. Twenty five ZPs in Maharashtra elected 1512 Members in the election. Out of 1512 winning candidates 433 belong to Other Backward Classes (OBC), 190 to Scheduled Castes (SC) and 154 candidates are from Scheduled Tribes (ST)[1]. This paper is an attempt to locate socio-economical background of ZP members on the basis of election affidavit filed by them for contesting the ZP elections. In the election form candidates have given details of age, category, caste, education, criminal background, occupation, income of self and spouse, land holding, movable and immovable property, loans and last elections fought[2]. On the basis of these variables, the paper tries to find out general traits of ZP members in Maharashtra.

Elections to the Rural Self Governing bodies are considered as mini assembly elections due to its political magnitude. These elections are parameter to gauge the mood of voters as well as the performance of the ruling party in the state. Since the formation of Maharashtra, three tier system of local self-government has been well established in the state. ZPs have become backbone of rural politics and agencies of patronage for political elites (Lele; 1982: 120). ZPs not only look after administration of rural areas of the district but also perform various roles. They are the institutions of patronage, agency of rural development and agency of political socialization and recruitment. The members of ZP and PS are important political functionaries as they work as linkage between voters and members of parliament (MP) and members of legislative assemblies (MLA) (Aware; 2016: 231). Elections to these bodies are considered politically significant; hence representatives of these bodies are also important. To unveil the rural politics it is important to unearth the socio-economic background of rural representatives.

Economic Positions of ZP members

Table no1 is based on data of movable and immovable assets declared by ZP members in their election affidavit. Eighty eight percent of ZP members have assets more than 10 lakh rupees. The number of crorepati ZP member is forty two percent. The number of crorepati representatives in SC and ST category is less as compared to general and OBC category. In general category more than fifty six percent ZP members are crorepatis whereas in OBC they are forty percent.

Table no. 1 Property of ZP members (Numbers in percentage)

Sr. No.	Property / Category	General	OBC	SC	ST	Total
1	Less than 10 lakh Rs.	4.65	6.99	29.47	**36.18**	12.03
2	10 to 50 lakh Rs.	20.81	28.2	**37.89**	33.52	29.91
3	50 lakh to 1 crore Rs.	17.9	23.77	18.94	13	19.47
4	1 to 10 crore Rs.	**49.36**	**37.29**	13.68	16	38.31
5	More than 10 crore Rs.	6.98	3.72	0	2	4.65

(Source: Election Affidavit filed by Candidates before state election commission)

Thirty six percent of ST representatives own property worth of less than 10 lakh rupees. The highest number of rich representatives belongs to the general category (see table 1). The number of members having asset between 10 lakh to 1 crore is forty nine percent. The declared assets has a column of present market price but the prices fed in the column do not reflect actual market prices. They are mostly undervalued. The financial worth of the properties of the ZP members will be more than what has been shown.

Among the elected MPs and MLAs from Maharashtra eighty two and eighty eight percent members are crorepatis (ADR 2014). While more than forty two percent ZP members are crorepatis. More than 88 percent of ZP members are millionaires. The number of crorepati ZP member is quite significant when compared to rural poverty. As more than 90 percent population in rural areas lives on less than Rs. 10000 a month (Sainath; 2017: 4). The ocean of rural poverty is being represented by islands of affluence.

Annual Income of ZP Members

As per the declaration in election form of ZP members following data has beenaccessed. 456 ZP members

(i.e. 31% of total ZP members) have shown their annual income as zero. In the zero income categories 406 are female candidates; their number is more than eighty nine percent in the category. When the income of the member and spouse are combined together the number goes down to around 17 percent. More than sixty three percent members have annual income of less than 2.5 lakh. Only around seven percent representatives have income more than 10 lakh per annum. The combined income of this segment rises more than double (see table 2). Out of total (795) women elected ZP members more than fifty one percent have declared their income as zero per annum. Either these members do not have any income source or they might be dummy candidates for their husbands. There would be difference between actual income of a person and the one shown to the authority. So the data filed in the affidavit may not be representative of actual financial status of elected ZP representatives.

Table no.2 Annual Income of ZP Members

Sr. No.	Income in Rupees	ZP Members Annual Income shown in Income Tax Returns (Numbers in percentages)	Combined Annual income of ZP member and his/her spouse (Numbers in percentages)
1	0 Rs.	31.08	17.51
2	Up to 50000 Rs.	11.52	8.38
3	50001 to 1 Lakh	8.17	7.15
4	1 Lakh to 2.5 Lakh	12.74	15.13
5	2.5 to 5 Lakh	17.58	18.2
6	5 to 7.5 Lakh	7.36	9.88
7	7.5 to 10 Lakh	4.36	7.36
8	Above 10 Lakh	7.15	16.35

(Source: Election Affidavit filed by Candidates before state election commission)

Land Holding of ZP Members

ZP is a rural local self-governing body. Agriculture used to be backbone of rural economy. Due to its pivotal role in local economy agricultural land was a source of prestige, income and stability. Ownership of agricultural land was one of the major factors in the emergence of dominant castes in Indian politics, after independence. Land ownership, numerical strength and control over local economy helped the agrarian castes in consolidating political power in respective regions. In Maharashtra too, Maratha caste

emerged as dominant caste because of its control over agricultural land (Palshikar; 2004: 107).

Most of the agrarian communities all over the world are facing high risk and uncertainty in their income flow (Malmberg and Hawton 1999). Share of agriculture in the economy is dwindling with the advent of globalization and liberalization. Fragmentations of agricultural land due to inheritance, uncertainty of income and volatile market conditions have made agriculture as an economically unviable enterprise (Deshpande; 2015: 85). Due to the emergence of new technologies and changing nature of the economy, the prestige and power attached to agriculture is waning (Aware 2016). Mere possession of agricultural land does not guarantee a victory in an election. In this background, it is interesting to look the relationship between agricultural land and ZP membership. Following tables show land ownership of ZP members.

Table no. 3 Land Holdings of ZP Members

Sr. No.	Land Holding	Percentage
1	Landless	18.37
2	0.01 to 1 Hectare	10.34
3	1.01 to 2 Hectare	14.43
4	2.01 to 5 Hectare	25.39
5	5.01 to 10 Hectare	17.9
6	More than 10 Hectare	13.54

(Source: Election Affidavit filed by Candidates before state election commission)

Out of 1473 elected ZP members more than forty three percent are marginal land owners. The number is quite significant. Merely thirteen percent members own more than 10 hectare land. The number of elected members owning less than 5 hectare land is sixty nine percent. It means, majority of the elected ZP members and their families do not own significant quantity of land. It shows that the delinking between land ownership and political power is taking place. Mere land ownership does not guarantee victory in election. It has lost its political significance due to changing nature of the economy (Aware 2016).

Category-wise break up of land ownership shows that ZP members of SC and ST own less land than the members of General and OBC community. More than thirty nine and forty percent of ZP members belonging

Table no. 4 Land Holdings of ZP Members Category-wise

Sr. No.	Land Holding	General	OBC	SC	ST
1	Landless	10.6	13.75	39.47	40.78
2	0.01 to 1 Hectare	7.16	13.75	13.68	11.18
3	1.01 to 2 Hectare	13.46	14.68	16.31	15.78
4	2.01 to 5 Hectare	28.51	26.57	19.47	15.13
5	5.01 to 10 Hectare	20.91	20.97	7.36	8.55
6	More than 10 Hectare	19.34	10.25	3.68	8.55

(Source: Election Affidavit filed by Candidates before state election commission)

to SC and ST category are respectively landless (see table 4). Number of marginal land owners in SC and ST category is sixty nine and sixty eight percent respectively. Even among General and OBC category number of marginal land owners is thirty one and forty two percent respectively. The number of members who own land up to 5 hectare is high among both General and OBC category. Sources and agencies of political power are changing in rural areas. Majority of the ZP members have less than 5 hectare land. It means land ownership has not remained a decisive criterion in rural politics as it used to be. Hence agricultural land has lost its political value in rural areas.

Sources of Income of ZP Members

In their affidavit most of the members have shown source of income as agriculture, housewife, business, profession, service and nil. On the basis of that data following chart has been prepared. One quarter of elected ZP members have shown their source of income as agriculture whereas 28 percent elected members have shown income source other than agriculture. It means in rural areas dependency on agriculture among political elites is waning.

Table no 6 analyses the spouses' income source of ZP woman members who have shown occupation as house wife. The forty three percent spouses are engaged in agriculture and more than fifty six percent are engaged for living on other sources than farming. It is common practice among politicians to show source of income as agriculture even though they are involved in other economic activities[3]. Prevalence of agrarian crisis in Maharashtra has made ordinary farmers life unmanageable. He finds it difficult to look after his family with meagre income from agriculture. So how is it possible for a farmer to

Table no.5 Source of Income of ZP members (Numbers in percentage)

Sr. No.	Source of Income	General	OBC	SC	ST	Total
1	Agriculture	37.13	34.79	24.08	32.67	34.28
2	Business	12.86	13.13	9.42	3.92	11.56
3	House Wife	33.67	36.40	47.64	42.48	37.21
4	Profession	10.54	9.44	8.90	3.92	9.31
5	Service	5.05	4.83	3.66	11.11	5.44
6	Nil	0.72	1.38	6.28	5.58	2.17

(Source: Election Affidavit filed by Candidates before state election commission)

Table no.6 Sources of Income of Spouse of Female ZP members (Numbers in percentage)

Sr. No.	Source of Income	General	OBC	SC	ST	Total
1	Agriculture	47.63	51.26	32.96	23.07	43.32
2	Business	24.46	24.05	17.58	13.84	21.93
3	Profession	3.86	3.16	1.09	4.61	3.29
4	Service	4.29	7.59	13.18	35.38	10.42
5	Nil	19.74	13.92	35.16	23.07	21.02

(Source: Election Affidavit filed by Candidates before state election commission)

spare money from his agriculture income to contest election and win? So, there is probability that those who have shown agriculture as their source of income are hiding real sources of income.

Education and Age of ZP Members

Contrary to the common belief that politicians are illiterate, the data reveals that out of 1473 ZP members only 54 have no schooling. Illiterate members are only three percent. More than seventy percent of the ZP members have studied above secondary level of schooling. The percentage of graduate and post graduate and technical degree holders is more than thirty four. It shows that the number of educated representatives at local level is rising. Even among SC and ST members negligible number of representatives are illiterates (see table 7).

ZPs are considered as a stepping stone for higher level of political positions, so the younger aspirants try

Table no. 7 Education of ZP Members

Sr. No.	Education	General	OBC	SC	ST	Total
1	Post Graduation	7.23	6.25	5.26	3.89	6.33
2	Graduation	27.06	23.61	15.78	23.37	24.19
3	Technical	3.61	4.39	2.63	4.54	3.81
4	HSC	18.08	18.28	16.84	16.88	17.85
5	SSC	18.37	20.37	15.26	15.58	18.26
6	Up to Ninth	16.2	14.35	22.11	4.93	14.29
7	Up to Fifth	6.36	11.11	14.73	12.98	9.54
8	No Schooling	3.03	1.62	7.36	7.79	3.68

(Source: Election Affidavit filed by Candidates before state election commission)

their fate in the elections. The table no 8 shows the number of young elected members is high. More than seventy seven percent of ZP representatives are aged below 50 years. Merely five percent are above sixty years. Category-wise age of representatives differs. In the ST category more than fifty percent members are below the age of 40 years. In OBC and SC more than forty-five percent members are below 40 years. The highest numbers of representatives in General category is between age group of 41 to 50 years. The highest number of ZP members belongs between the age group of 30 to 50 years.

Table no. 8 Age-wise categorization of ZP Members

Sr. No.	Age	General	OBC	SC	ST	Total
1	21 to 30	7.35	13.82	15.26	25.8	12.22
2	31 to 40	31.6	32.48	30.52	32.25	31.79
3	41 to 50	38.52	28.8	33.68	22.58	33.35
4	51 to 60	17.46	20.5	15.26	12.25	17.52
5	Above 60	5.05	4.37	5.26	7.09	5.09

(Source: Election Affidavit filed by Candidates before state election commission)

Caste, Region and Representation

In Maharashtra twenty-seven percent of seats in local self-government bodies are reserved for OBC. In the OBC category 51 different castes got representation in ZPs. The major share has been

occupied in the category by Kunbi caste (39.94%), which is followed by Dhanagar (11.64%), Vanjari (8.73 %), Mali (8.46%), Teli (5.82%), Banjara (5.02%), Wani (4.23%). Except Konkan region, Kunbis are predominant in almost all six administrative regions. Dhanagars and Kunbis have almost equal representation in the Western Maharashtra. In the Marathwada region Vanjari caste has share of 34.24 % while Kunbis and Dhanagars are respectively 31.5% and 26 %. In Konkan region Bhandaris got more representation in OBC category (21.73%) followed by Kunbis (13.04%). In Nagpur region Telis got second highest representation after Kunbis. Thus, the representation of castes and preponderance of a caste in the category also changes with region. However, Kunbis have more representation across the state.

Twelve different castes belonging to the SC category got representation in the ZPs. Among them the preponderance of Mahar caste is discernible in the category as more than 60 % seats are won by the caste. Charmkar caste got second highest representation (23.15%) followed by Matang (11.57%). All remaining eight castes got single representative elected in ZPs. Everywhere, apart from Nashik region, Mahar's have dominance in the SC category.

Twenty two different castes belonging to the ST category got representation in the ZPS. Gonds which has dominance in Nagpur region has got highest representative in the category (20.64%). Mahadev Koli (14.19%), Bhil (13.54%), Andh (10.96%) are a few castes among the ST category which got more representatives.

ZP as an Agency of Political Recruitment

Local self-governing bodies are considered as training institutions of politics. These bodies not only train future State and National political leaders but also imbibe them with political culture, administrative nitty-gritty's. Membership of ZP provides a platform for aspiring and potential political leaders in upward political mobility. Being the highest decision making body in rural affairs, membership of ZP has certain aura among local political elites. Most of the Panchayat Samiti members and Sarpanch aspire to be members of ZP. The data shows that majority of the elected ZP members have earlier fought elections at various levels. More than fifty six percent of general category members have contested Panchayat Samiti, ZP or Grampanchayat elections (See Table no. 9).

Table no. 9 Electoral Experience of ZP Members

Sr. No.	Category	Percentage
1	General	56.91
2	OBC	49.41
3	SC	38.94
4	ST	44.15
5	Across Category	50.54

(Source: Election Affidavit filed by Candidates before state election commission)

Even though in Maharashtra fifty percent seats are reserved for woman candidates, their representation is more than fifty four percent. In the Indian Parliament merely eleven percent members are women. In the Maharashtra assembly only 20 women (6.9%) are female members. But in ZPs we find more woman representatives than their quota. Why? It means some of general category seats have been won by women. Considering patriarchal nature of Indian society, it is unlikely that female candidates will win in a general category seat, unless having some strong political background. In many districts wives, daughters and daughters in law of sitting MLAs and MPs have won the election. District level political dynasties are not ready to share political power and resources outside family. In Ahmednagar district ZP President is wife of a prominent leader of Maharashtra and Deputy President is wife of an MLA. In Kolhapur also ZP President is wife of a MLA and daughter in law of a MP. In Ahmednagar ZP more than ten percent members are wives or blood relatives of MLAs. To keep close control over political space and resources MLAs and MPs try to control maximum power through local bodies. Decentralization of political power was one of the noble goals behind implementation of 73rd constitutional amendment (Manor; 2011: 65). However, in practice decentralization has become chimera. Dominant political leaders of district through their relatives or proxies use ZP's resources to maintain their political fiefdom.

Among the female candidates more than sixty two percent have contested ZP as first election in their political career. Why the percentage of novice female ZP members is high? As earlier noted, in Maharashtra 50 percent seats are reserved for women. When a constituency becomes reserved for woman, the seating or willing candidates have to give opportunity (unwillingly) to the wife, mother, or daughter. Thus, the number of first time woman contester is more as compared to men. Probably these woman members are proxy to their husbands or father[4].

Table no 10 Number of Elected Woman ZP Members and Woman ZP members without any electoral experience

Sr. No.	Category	Percentage of Elected Woman ZP Members (number in percentage)	First Time Elected Woman ZP Members (number in percentage)
1	General	52.15	65.87
2	OBC	54.73	61.18
3	SC	55.78	53.84
4	ST	57.79	62.06
5	Across Category	53.97	62.03

(Source: Election Affidavit filed by Candidates before state election commission)

Criminal Background

Crime and politics are considered interlinked. However, a close analysis of criminal records of ZP members shows a different picture. Merely 11 percent elected members are having criminal cases against them. The number of criminal politicians is highest among General category (14.55%) and lowest among SC (3.68%). There are criminal cases against 19 female members i.e. 3.14 percent of female members. Among these female members more than 78% have fought elections previously. More than 73% and 26% cases are against the females of General and OBC category respectively. There are no cases against females of SC and ST category.

The nature of these cases is also not very serious. Most of the cases are related to IPC 353 (Assault or criminal force to deter public servant from discharging of his duty), 143 (Unlawful assembly), 147 (Punishment for rioting) etc. Being a political representative one needs to attend public protests and intervention for public in public offices. As a result of these political interventions these cases might have been filed against the members.

Another interesting finding is that, there is linkage between the level and number of elections fought by a candidate and criminal cases on him. If a candidate has fought many elections, there is likelihood that more cases will be against him. Some of the members who contested state assembly elections have more cases against them than the member who has contested PS election. Even there is linkage between number of previous election contested and criminal cases against the members. Among the number of accused members more than 77 percent have fought election prior to 2017 elections. Among the 78.94% of

Table no.11 Criminal Background of ZP members

Sr. No.	Category	Criminal Cases (in Percentage)	Experience of Previous Election and Criminal Background (in percentage)
1	General	14.55	77
2	OBC	10.98	2.97
3	SC	3.68	57.14
4	ST	7.79	66.66
5	Overall Percentage	11.35	77.1
6	Female Members	3.14	78.94

(Source: Election Affidavit filed by Candidates before state election commission)

females members having criminal cases have fought election previously. They have contested either of Zilla Parishad, Panchayat Samiti, or Grampanchayat elections. It proves linkage between criminal cases and contesting of election.

Conclusion

Though the analysis is based only on data presented to election commission it helps to find out certain trends in rural politics. It has helped to situate socio-economic standing of the ZP members. Bourgeoning cost of electioneering has direct impact on economical position of political aspirants. On the condition of anonymity, a few ZP members have conceded that they have spent between thirty to fifty lakh rupees on campaigning. It means ZP elections are a costly affair. Ultimately ZP membership has been reserved for economically powerful candidates only. The number of crorepatis is rising among ZP members too. The second conclusion we can draw is that land and rural politics is getting delinked. Number of land lords is less and marginal land owners are high among the elected ZP members. Dependency on agricultural among members is also on decline. The relationship between agriculture and politics is no more as it used to be 1980s.

The control of district level political dynasties over ZP is palpable. MLAs and MPs use ZP as another terrain to perpetuate their power and hold over district. Instead of decentralization, ZPs showcases absurd concentration of political power in certain families in a district. Number of educated and young members is rising. Criminalization of rural representative is less as compared to other representatives. Thus, it was a miniature of Indian politics which

reflects some of the major trends of national and state politics while negating few.

Notes

1. In Maharashtra there are 34 Zilla Parishads, however, in February 2017 elections were held in 25 Zilla parishads all over Maharashtra. The total number of members of 25 ZPs is 1512 but online data was available for the paper is of only 1473 ZP members. Among these Male are 678 and Female ZP members are 795.

2. All these forms are available at the website of Maharashtra State Election Commission https://panchayatelection.maharashtra.gov.in/MasterSearch.aspx

3. The researcher had interviewed ZP members from Ahmendagar district. Those who have mentioned farming as their sources of income told that they are into real estate development, businesses, contractors, suppliers.

4. In Ahmednagar district in when GAT no 47 was reserved for woman candidate sitting PS member, who was willing but could not contest due to reservation gave candidacy to his daughter.

References

1. Aware Ankush (2016): Badalati Jamindharana ani Tyacha Maharashtrachya Rajkaranawar Padnara Prabhav (Marathi; Changing Pattern of Landwonership and Its impact on Political Process), Ph.D. Dissertation, Dept. Politics and Pub. Administration, SPPU, Pune.

2. Deshpande R.S. (2015): Farmer Distress and Suicides, in Basu Kaushik (ed) The Concise Oxford Companion to Economics in India, New Delhi: OUP.

3. Lele Jayant (1982): Elite Pluralism and Class Rule: Political Development in Maharashtra, Mumbai: Popular.

4. Malmberg, Sue Simkin and Keith Hawton (1999): 'Suicides in farmers' British Journal of Psychiatry, 175:103-5.

5. Manor James (2011): Local Governance, in Jayal N. and Mehta P. (ed) The Oxford Companion to Politics in India, New Delhi: OUP.

6. Palshikar Suhas (2004): Samkalin Bharatiya Rajkaran (Marathi; Contemporary Indian Politics), Pune: Pratima.

7. Sainath P (2017): Everybody Loves a Good Drought, New Delhi: Penguin.

8. ZP member's election affidavits are available at the website of Maharashtra State Election Commission

https://panchayatelection.maharashtra.gov.in/MasterSearch.aspx

https://adrindia.org/research-and-report/election-watch/lok-sabha/2014/lok-sabha-2014-winners-analysis-criminal-and-finan accessed on 1st January 2018.

https://adrindia.org/research-and-report/election-watch/state-assemblies/maharashtra/2014/winners-report-analysis accessed on 1st January 2018.

Keywords – Local Self Government, elections, Zilla Parishad

❐ ❐ ❐

An Invitation

The Local Government Quarterly invites contributions in the form of articles and research papers from its readers and well-wishers.

Contributions may be e-mailed to us in digital form as a Word file.

Articles could normally be between 3000 and 4000 words, though we do not wish to limit the size. As we print in black and white, tables, charts, graphs, images, etc. need to be compatible. We reserve the right to edit for sense, style and space.

Contributors may mail their articles to the Chief Editor, Local Government Quarterly.

All India Institute of Local Self-Government
M. N. Roy Human Development Campus, Plot No.6, 'F' Block,
TPS Road No.12, Bandra (E), Mumbai – 400051, India.
Tel : +91-22-2657 1713 / 2657 1714 / 6180 5600
E-mail : aiilsgquarterlyjournal@gmail.com, info.algq@gmail.com
Fax : +91-22-2657 2115

Assessment of Solid Waste Management of Ludhiana City: Public Health and Environmental conditions

Kartik Sally

1. Introduction

Inability to manage the solid waste by developing countries is noticeably seen, as urban local bodies are not able to deal with the ever increasing rapidity of waste generation (United Nations Department of Economic and Social affairs, 2012). Veolia environmental services (2006), found that out of total, more than half of the solid waste collected in developing nations is time and again disposed of through unrestrained landfills and only 15 per cent is treated all the way through precarious and informal means of recycling. As per Punjab Pollution Control Board 2010 study, Solid Waste Management (SWM) is a major quandary for many urban local bodies (ULBs) in India as well, and the key reasons behind escalating municipal solid waste (MSW) generation per person are urbanization, industrialization and economic growth. According to Pattnaik and Reddy (2010), MSW generation rates range between 0.3 and 0.6 kg/capita/day for Indian cities and annual increase in MSW generation (volume) is forecasted as 1.33 % per capita. The total waste produced in urban India is approximately 1,70,000 tonnes per day, works out to be about 62 million tonnes per year, and this is forecasted to increase by 5% every year corresponding to population growth and changing lifestyle of people (Planning Commission, 2014). Data show that urban India generated 31.6 million tonnes of waste in 2001 and is currently generating 47.3 million tonnes. By 2041, waste generation is predicted to be 161 million tonnes, a fivefold increase in four decades.

This uncontrollable growth of solid waste has resulted into a disorganised situation at different stages from generation to disposal. The waste is not collected 100 percent and also the effectiveness of waste collection is still

Table1: Predicted population growth and overall impact on waste generation.

Year	Population ($\times 10^6$)	Per capita generation (kg per day)	Total waste generation (x 106 Tonnes per year)
2001	197.3	0.439	31.63
2011	260.1	0.498	47.30
2021	342.8	0.569	71.15
2031	451.8	0.649	107.01
2036	518.6	0.693	131.24
2041	595.4	0.741	160.96

Source: Annepu (2012).

short; collection is done in open trucks which is hazardous and insanitary; there are very few waste recovery and processing units; and the waste is usually dumped unsystematically at open dump sites with no leaching treatment (High Powered Expert Committee, 2011). Municipal solid waste management (MSWM), is a significant factor for achieving sustainability in metropolitan development, comprising generation and segregation, storage, collection and segregation, transfer stations, treatment and processing, and disposal of solid waste to reduce its unhelpful impact on the environment (Kumar, Bhattacharyya, Vaidya, Chakrabarti, Devotta, and Akolkar, 2009). Inability to manage MSW becomes a reason for spread of countless ailments. In a short time, out of all the environmental pollutants, solid waste is the one most speedily generating pollutants and even than the greenhouse gases (GHGs) (Hoornweg, Bhada-Tata, Kennedy, 2013).

According to Census of India (2011), Ludhiana district ranks 3rd in area and 1st in population in the State. The decadal population growth rate in the district (15.4%) is higher than the state average (13.9%). And also it is highly urbanised as 59.2 percent while that of state it is 37.5%. It is estimated that per capita waste generated per day is of the order of 535 gms. In all, city generates garbage to the tune of 850 mts on daily basis. The amount of garbage generated on per capita basis is quite on the higher side considering the pattern of garbage generation in other cities of the country which ranges between 300 to 450 gms, as against 535 gms generated in Ludhiana (Ludhiana Masterplan Report, 2011). Ludhiana being most populous city of the state and one of the leading waste generators in the country needed to be reviewed with regard to solid waste management.

This paper provides a review and critique of the existing literature relating to MSWM, Ludhiana. It points to the general lack of clarity in the literature of the factors that facilitate and hinder the management of solid waste in Ludhiana. The objectives of the study are to focus on solid waste management on the foundation of the parameters of Public Health and Environment by identifying waste characteristics and components and finally suggesting some concepts to mitigate the shortcomings.

2. Methods

The data regarding the study were collected in February, 2016 as a part of dissertation "Appraisal of Solid Waste Management, Ludhiana City" submitted in partial fulfilment for the award of masters in planning infrastructure degree for session 2015-16 in Guru Ramdas School of Planning, Guru Nanak Dev University, Amritsar. Before framing the data identification kit a thorough literature study was conducted and a parameter list was developed to assess the effectiveness of MSWM of Ludhiana as per study objective. The list of the parameters that are physical components are from JnNURM toolkit 2015, and its indicators are derived from Case study of SWM, Ahmedabad, Municipal Solid Waste Management Manual by MoUD, The Plastics (manufacture, usage and waste management) rules, 2009, and Bio-medical waste (management and handling) rules, 1998 as discussed in the dissertation. Two physical components mentioned in the list are Public health to be studied correspondingly to stage of generation and collection and Environment to be studied focusing on disposal stage and general condition of the landfill site is also assessed. This whole list helps us to assess the disorderliness of MSWM of Ludhiana city in a very accurate and critical approach.

Table 2: List of the Parameters

Sr. No.	Physical Component	Physical Component Indicator name
1	Public health - waste Generation/collection	Waste captured by the solid waste management: % of waste generated that is collected and delivered to an official facility for the treatment or disposal.
2	Environmental Control - Disposal	Controlled treatment or disposal: The general condition of the landfill sites and comparison of leachate characteristics of the landfill sites.

It took a whole month to collect data from all the sources. There was no primary source nor interviews were held. Data were collected from secondary sources that are Municipal Corporation office Ludhiana, Masterplan Report 2021 Ludhiana and site visits were conducted to know the conditions and working of treatment and deposal plants of Jamalpur, Jainpur and Noorpur site. All the data is analysed on the basis of both the parameters below:

3. Public Health

Concept of public health is abstractly different from the medical services. The key action for maintaining public health is to minimize public exposure to infections. Therefore monitoring waste transportation and disposal is one of the ways for better public health outcomes (Gupta, 2005). Unmanaged solid waste is always a prospective risk to environment and health. The workers involved in the collection and disposal of the solid waste are directly in contact with waste so they are highly vulnerable to the health risks and need to be protected. But in case of general public, the risks to the health come indirectly from the breeding of disease vectors, primarily flies and rats (Royal Commission, 1984). As such, in case of Ludhiana, we can analyse the quantum of the risk to public health from the quantum of the waste being exposed to the public all the time that is percentage of waste generated that is not collected and delivered to an official facility as per the parameter of the study.

In Ludhiana, primary collection is said to be met 100 percent and each household is covered as claimed by MC Ludhiana as well as by Masterplan Report, Ludhiana. As per the data in Table 3, the major amount of solid waste that is 453 MT out of 850 MT that is 53.3 percent is still collected by the non-motorised vehicles because of accessibility due to traffic and narrow roads. And only 46.3 percent of the waste is collected by tractor trolleys, mini Tata and truck tippers.

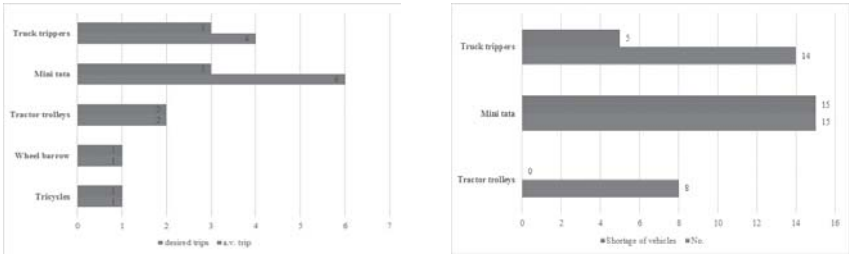
Table 3: Amount of solid waste collected by different vehicles

Vehicle Type	No.	Capacity	A.V. Trip	Qty. Handled(Mt)
Tricycles	600	0.6	1	360
Wheel Barrow	465	0.2	1	93
Tractor Trolleys	8	2	2	32
Mini Tata	15	1.2	6	108
Truck Tippers	14	4.5	4	252

Source: City Development Plan, Ludhiana (2006).

Also if we take a look at the number of trips made by these vehicles it is still more than the desired trips. Hence if we compare the data of the generation of solid waste and number of trips made by collection vehicles, the noticeable crunch in the shortage of collection vehicles is being noticed as shown in the graph.

Figure 1: Shortage of vehicles



But the crunch to be noticed is not only in the shortage of collection vehicles but the other collection resources which are completely missing in the picture. The major collection resources missing in Ludhiana are compacters which tend to increase the efficiency of collection vehicles and transfer stations which are meant to store the solid waste which is not transferred to disposal site daily and act as intermediate point and support other activities like segregation and recycling if not done at generation stage.

So as a result the 53.3 percent of total Ludhiana solid waste collected by the non-motorised vehicles is not transported to the official disposal or treatment site and can be seen in the corporation's paved and unpaved containers, on road sides, and Buddha Naala. Even out of this, only corporation's containers are cleaned sometimes and waste is transferred to disposal site but cleaning is irregular and containers again get filled up with new solid waste collected. Hence the cycle is unbreakable. Ultimately public is always exposed to solid wastes at different points in the whole city.

These pictures of different areas of Ludhiana city help one to understand the intensity of the problem of public health. This exposed solid waste on one hand being a blot on the landscape to the city is also an immense threat to public health as interpreted from above information. Hence as per first parameter that is- Waste captured by the solid waste management: % of waste generated that is collected and delivered to an official facility is only 46.7 percent and this establishes the disorderliness of solid waste management in Ludhiana.

Figure 2: Heaps of waste along Civil Line Road and Dandi Swami Road, Ludhiana.

Figure 3: Waste exposed to public in Budda Naala and Jagraon Road, Ludhiana.

4. Environmental Control

In recent times, the social and environmental shock forced by Municipal Solid Waste received due thought (Calvo, Morne, Zamorano, Szanto, 2005). Subsequently, various policies, plans, new techniques and methods were developed for managing the solid waste in a better way. These include Recycling, Reuse, Compositing, Plasma gasification and Vitrification and finally to properly designed and operated sanitary landfills for final rejects (Narayana Tapan). Although a well-designed and efficiently operated landfill site can eradicate some of the environmental problems, other impacts may arise from gas and leachate formation if not well controlled (El-Salam, 2014). For this reason, in case of Ludhiana for assessing the

environmental control aspect as per our parameters we need to analyse the conditions of the disposal sites and leachate characteristics of landfill sites.

The solid waste from different selected collection sites is transported to the dumping site by municipal corporation staff. There are three dumping sites being developed by the Corporation of Ludhiana at different ends of the city.

Table 4: Dumping Sites, Ludhiana.

Sr. No.	Site	Land areas	Average depth	Future Life (Yrs)
1	Jamalpur	25	12 to 15	25
2	Jainpur	10	Filled	Nil
3	Noorpur Bet	20	8 to 10	20

Source: City Development Plan, Ludhiana (2006).

Jainpur Landfill site:

Jainpur landfill site is completely crammed and has no future life therefore needs to be closed down. The Corporation has closed this site and ordered not to dump other solid waste here but the dumping practice is still continuing. The reason being it is more accessible to certain areas as compared to other dumping sites. Hence it is required to scientifically close this landfill site and then develop it for other uses, or else the leachate and gas effect will continue to harm the environment.

Jamalpur and Noorpur Bet Landfill sites:

Jamalpur is the biggest disposal site in the city with area of 25 acres and is operational. Noorpur bet is the newly developed site and is double the size of Jainpur site. However both disposal sites are not lined and also scientific disposal of waste does not take place. The Jamalpur site is located near to a village 'Jamalpur' and hence site is creating nuisance in the surrounding residential areas. Also the site does not have any kind of fencing or compound wall, green belt, entrance gate, parking area, weighbridge, workshop and garage, Washing facility, surface water drains, lighting facility and fire- fighting facility, which are very necessary for the operation of any disposal site in order to serve as long as its projected age. Noorpur Bet landfill site has been exclusively purchased by the Corporation with a specific intention to use it for installing solid waste

treatment plant. But both the sites are developed unscientifically and leading to nuisance in the surrounding areas; posing environmental risks like ground water contamination, air pollution, soil contamination and possible health risks to the residents of surrounding areas. So the analysis of the characteristics of Leachate will give us insight into the severity of the impact of the respective landfill and disposal sites.

Figure 4: Solid waste exposed at Jainpur, Jamalpur and Noorpur bet.

On the basis of six parameters the comparative analysis of the all the three landfill sites is made. The standards for land disposal are taken from Solid Waste Management Rules 2000. The individual implication of the each parameter is discussed as follows:

Table 5: Comparative leachate characteristics of landfill sites

Sr. No.	Parameters	Jainpur	Jamalpur	Noorpur Bet	Standards for land Disposal (MSW Rules 2000)
1	PH	9.3	9.8	9.5	5.5 to 9
2	SS	615	1132	886	200
3	TDS	5348	6563	5693	2100
4	Turbidity	43	79	68	10
5	BOD	329	495	406	100
6	BOD:COD	.24	.19	.20	.50

Source: Bhalla, Saini and Jha (2012).

PH Value:

PH is one of the factors determining the leachate composition, amount generated and the extraction of probable pollutants (Westake, 1995). PH value of leachate samples of Jainpur, Jamalpur and Noorpur bet landfill sites were 9.3, 9.8 and 9.5, which are higher than the standard of

5.5 to 9. So this elevated level of pH shows that an unbreakable flow has been attained between acid producing processes that are cellulose and lignin degradation and acid consuming processes that are methane formation at the landfill (Chu, Cheung and Wong, 1994).

Semi- Solid and Total Dissolved Solids:

TDS is one of the important parameters in the consideration for licensing the discharge of landfill site leachate in developed nations (Koshy, Jones and BeruBe 2008). TDS and SS basically comprise inorganic salts and dissolved organics. Semi solid values of leachate samples of the landfill sites were 615 mg/l, 1132 mg/l, and 886 mg/l, respectively. TDS values of leachate samples of the landfill sites were 5348 mg/l, 6563 mg/l and 5693 mg/l, respectively. So these high values of TDS in leachate samples which are more than double the standard value indicates the very high presence of inorganic substances in the samples(Nagarajan, Thirumalaisamy and Lakshumanan, 2012).

Turbidity:

Turbidity and colour are a result of the high suspended particles in the leachate (Sackey and Meizah, 2015). The standard value for the turbidity as per MSW rules is 10 Nephelometric Turbidity Unit (NTU) and Turbidity values of Jamalpur, Jainpur and Noorpur Bet are 43 NTU, 79 NTU and 68 NTU, respectively. So the leachate samples are four to seven times higher than the standard value. The Jainpur landfill site has the lowest turbidity value due to its age and stabilization of leachate.

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD):

BOD determines the biodegradable organic mass of leachate and the maturity of landfill which is inversely proportional to time (Qasim and Chiang, 1994). The BOD values for Jainpur, Jamalpur and Noorpur Belt were 329 mg/l, 495 mg/l and 406 mg/l, respectively. But the standard BOD value is 100mg/l which is relatively low as compared to measured values. Other indicator BOD and Chemical Oxygen Demand (COD) ratio indicates the biodegradability of the leachate. It is also quite low in case of Ludhiana that is 0.24, 0.19 and 0.20. A leachate below the BOD and COD ratio of 0.5 cannot be treated biologically. (Bhalla, Saini and Jha,2012).

Commonly, leachate are comprising of many pollutants such as high quantity of organic matter (unmanageable for biodegradation), organic and inorganic salts, ammoniacal nitrogen, heavy metals which are a great risk to the surrounding soil, groundwater and even surface

water (Renou, Givaudan, Poulain, Dirassouyan and Moulin, 2008). So in case of Ludhiana, It is observed from the various physicochemical parameters that leachate samples contain high concentration of contaminants beyond the permissible limits. Each of the characteristic of the leachate falls outside the standards and all the three landfill sites of Ludhiana are non-engineered, do not have any bottom liner and prevention system or technology to tackle the leachate. As a result all the leachate can easily penetrate into the surrounding environment by affecting air and ground water as most critical feature. Therefore as per the second parameter of environmental control whose indicator is controlled treatment or disposal, the general condition of the landfill sites and comparison of their leachate characteristics are found to be very poor.

Conclusion:

Principally the study asseses the SWM in Ludhiana city from the view of two physical components discussed that are Public health which is studied in relation to generation and collection, and Environment, studied focusing on disposal stage and general condition of the landfill site. If we take a look at these individually, as per first parameter that is- waste captured by the solid waste management, percentage of waste generated that is collected and delivered to an official facility is only 46.7 and this establish the disorderliness of solid waste management in Ludhiana. To overcome this problem the shortage of the collection vehicle is first needed to be tackled immediately and also transfer stations are needed to be set up so as to increase the efficiency of the vehicle and to ensure that the recyclable waste is not wasted. Other than these the general awareness initiative is needed to be undertaken by government or some enforcement is to be made so as to tackle the heaps of the garbage on roads. On the other hand as per the second parameter of Environmental control whose indicator is Controlled treatment or disposal, the general condition of the landfill sites and comparison of leachate characteristics of the landfill sites also are found to be very poor. Here too in order to overcome the problem, immediate action is called for to address the shortage of necessary infrastructure such as of fencing or compound wall, green belt, entrance gate, parking area, weighbridge, workshop and garage, washing facility, surface water drains, lighting facility and fire-fighting facility. Thereafter, efforts are needed to control the affect of leachate whose intensity is discussed, and steps are to be taken to restrict their entering the environment by proper lining of landfills and by modern landfill concepts. Overall the solid waste management of Ludhiana is proven to be failing with respect to the physical parameters of public health and

environment and needs to be tackled with the abovementioned or better curative measures to reduce the future harmful impacts.

References

1. Annepu RK, 2012. Report on sustainable solid waste management in India. Waste-to-Energy Research and Technology Council, 1-189.

2. Calvo F. , Moreno B. , Zamorano M. , Szanto M. , 2005. Environmental diagnosis methodology for municipal waste landfills waste management. Waste Management Elsevier, 25(8):768-79

3. Census of India, 2011. District census handbook Ludhiana village and town wise Primary Census Abstract (PCA). Directorate of census operations Punjab, 35-40.

4. Chu L.M., Cheung K.C and Wong M.H., 1994. Variations in the chemical properties of landfill leachate. Journal of Environmental Management, 18(1), 105-117.

5. City Development Plan, Ludhiana, 2006. Jawahar Lal Nehru Urban Renewal Mission, Ministry of Urban Development. 8.1-8.12.

6. Ehrig HJ, Scheelhaase T (1993). Pollution Potential and Long Term Behaviour of Sanitary Landfills, SARDINIA 93 Fourth International Landfill Symposium Proceedings, Cagliari, Sardinia, Italy. 2:1203-1225.

7. El-Salam Abd Magda.M and Zuid-Abu Gaber-I,2015. Impact of landfill leachate on the groundwater quality: A case study in Egypt, Journal of Advanced Research, Volume 6, Issue 4, Pages 579-586.

8. Gupta Monica Das, 2005. Public Health in India: An Overview. World Bank Policy Research Working Paper, 3787, 1-2.

9. High Powered Expert Committee, 2011. Report on Indian Infrastructure and Services, 53-54.

10. Hoornweg D, Bhada - Tata P, Kennedy C, 2013. Waste production must peak this century. Nature, 502:615–617.

11. Koshy L., Jones T. and BeruBe K, 2008. Bioreactivity of municipal solid waste landfill leachates - Hormesis and DNA damage. Water Research, 42 (8-9), 2177-2183.

12. Kumar, S, Bhattacharyya, J. K, Vaidya, A. N, Chakrabarti, T, Devotta, S, and Akolkar, A. B., 2009. Assessment of the status of municipal solid waste management in metro cities, state capitals, class I cities, and class II towns in India: An insight. Waste Management, 29, 883–895

13. Nagarajan Rajkumar, Thirumalaisamy Subramani and Lakshumanan Elango, 2012. Impact of leachate on groundwater pollution due to non-engineered municipal solid waste landfill sites of Erode city, Tamil Nadu. Iranian Journal of Environmental Health Science and Engineering, 9(1), 35

14. Narayana Tapan, 2009. Municipal Solid Waste Management in India: from waste disposal to recovery of resources. Waste Management Elsevier, 29 (2009),1163-1166.

15. Pattnaik S. and Reddy M.V., 2010. Assessment of Municipal Solid Waste Management in Puducherry, India. Resource, Conservation and Recycling, 54(8), 512–520.

16. Planning Commission, Government of India, 2014. Report of the Task Force on waste to energy in the context of integrated municipal solid waste management, 1, 1-3.

17. PPCB (Punjab Pollution Control Board), 2010. Status report on municipal solid waste in Punjab, 35-36.

18. Qasim S.R. and Chiang W, 1994. Sanitary Landfill Leachate. Generation Control and Treatment. Lancaster, PA: Tecnomic Publication.

19. Renou S., Givaudan J.G., Poulain S, Dirassouyan F. and Moulin P., 2008. Landfill leachate treatment: Review and opportunity. Journal of Hazardous Materials, 150, 468-493.

20. Royal Commission on Environmental Pollution, 1996. 10th Report tackling pollution - experience and prospects London, 112-113.

21. Sackey Lyndon Nii Adjiri and Meizah Kojo, 2015. Assesement of the quality of leachate at Sarbah landfill site at Weija in Accra. Journal of Environmental Chemistry and Ecotoxicology, Vol.7 (6), pp. 56-61.

22. United Nations Department of Economic and Social Affairs, 2012. Municipal solid waste management: turning waste into resources. Shanghai Manual – a guide for sustainable urban development in the 21st century, 1-2.

23. Veolia Environmental Services, 2006. From waste to resource, an abstract of world waste survey, 11-12.

24. Westlake K.,1995. Landfill waste pollution and control. England: Albion publishers.

Book Review

Untamed Urbanization
Edited by Adriana Allen,
Andrea Lampis and Mark Swilling
Published by Routledge
Publication, London

One of the significant challenges in the 21st century is to understand the trajectories of urban development and how it effects the urban anthropocene. The recently published book "Untamed Urbanization" by Adriana Allen, Andrea Lampis and Mark Swilling tries to address this question through re-politicizing the relationship between urban development, sustainability and justice. Moreover the book explores the tensions emerging under real circumstances, as well as their potential for transformative change. The book raises concerns about cities' purpose for the people and depicts cities as places of unique opportunities for sustainable innovations. The entire book is based on some case studies of global North and South. Through these case studies writers try to integrate socio-ecological perspectives on the contemporary challenges of urban development both in the North and the South.

The book has four parts and each part consists of several case studies. The first part is focused on effects of urban anthropocene. It argues that urban modernity tamed the nature by reducing the nature into flows conducted by urban infrastructure. It also emphasizes the method of co-production of urban services by organized social movements and state agencies instead of privatized urban services. Case study of East Kolkata Wetland, which purifies the waste water of Kolkata, re-establishes the fact that urban modernity shifted from taming to outright destruction of nature. In fact history of urban planning and development shows that taming of the city is done to prepare for fundamental changes in city and popular smart city idea is one such effort as noted by the author. However the growing size of the population in the city and cities' horizontal expansion, raise the concerns of different crucial issues ranging from the security of urban food supplies to governance in the contemporary urban development.

In the second section, there are case studies focused on some major debates in urban studies which include the polarity between agency and structure and how human and non-human living beings possess active agency within wider socio-ecological dynamics of change. Case of Bogota points out that urban areas in the global South are becoming the testing ground for new social configurations of social

protection, which are of great relevance for people and agency in general, not only for the poor. These reconfigurations factually respond to the new logic of privatization and commodification of individual and collective security. Both the case studies of Lagos and Mexico show how ethnicity, age and gender shape social vulnerability outcomes and deeply influence the struggle for more sustainable livelihoods in the context of peri-urban areas. Case of Dar-es-Salam identifies such social vulnerability with respect to slum dwellers perspective.

The third part addresses the various perspectives, the problematic and often contradictory role of urban planning processes and mechanisms within rapidly changing cities around the world. Both the cases of Mexico City and Ethiopia address the conceptual shifts in contemporary urban planning and stress on the public participation, such as 'community planning'. While case of Ghana outlines the potential for land being returned to public use as a means of promoting sustainable urbanization and case of Ireland invokes the idea of just city or right to city in the context of policy frameworks advocated by supranational organizations such as UN-HABITAT and the European Commission. Therefore, this section tries to advocate the bottom up urban planning with complete public participation as well as city to be more just in nature from the perspectives of the vulnerable groups.

The last part explores the narratives developed by people living in cities and beyond the limits of the contemporary disciplining practices. These chapters examine the untamed practices of those who claim time freedom over the dictates of formal work, the latter explored as a deeply embedded and naturalized requirement to be included in the city. Case of downtown area in Buenos Aires city examines the clash between the mutually encroaching practices and aspirations of real estate developers, upper-and middle-class urbanites, working-class women and men, and slum dwellers. While the case of Cape Town scrutinizes the transformative potential of a diversity of social experimentations that playfully seek to overcome the material and narrative Apartheid legacy of fragmentation and segregation.

Therefore, the book tries to cover the range of contemporary issues relating to urban planning and development and it is enriched by the various case studies from different parts of the globe. It is remarkable that this book criticizes the contemporary urban development and planning practices and sometimes suggests an alternative ways to deal with the problematic areas.

There are few publications which address such wide range of issues related to problem and perspective of contemporary urban planning and development. However, some weakness is needed to be mentioned. The book singularly focuses on class in the analysis of contemporary urban planning and development problem. Role of urban governance in dealing with urban planning and development has not been properly explored. Nevertheless, untamed urbanization successfully able to identify and capture the contemporary urban planning problem across the different continents in the globe.

Joy Karmakar

❐ ❐ ❐

Our Contributors

- **Protus Mbeum Tem**

  Protus Mbeum Tem is with the Bamenda University of Science and Technology and the Catholic University of Cameroon, Bamenda.

- **Chaganti Nagaraja Rao**

  Dr. Chaganti Nagaraja Rao is Senior Faculty, Center for Telangana Studies, Dr. MCR. Human Resource Development Institute of Telangana, Hyderabad.

- **Ravulapati Madhavi,**

  Dr. (Mrs) Ravulapati Madhavi is Associate Professor of Law, Center for Telangana Studies, Dr. MCR. Human Resource Development Institute of Telangana, Hyderabad.

- **A.K. Jain**

  A.K. Jain is Former Commissioner (Planning) DDA, Member MOUD Committee on DDA (2015), Member GNCTD Committee on Delhi Vision 2030 (2017), UN Habitat Consultant, Author of Towards Clean and Hygienic Cities and Villages.

Contd...

- **T. Brahmanandam**

  Dr. T. Brahmanandam is Associate Professor at Centre for Multi-Disciplinary Development Research, Dharwad.

- **Ankush P Aware**

  Ankush P Aware is Assistant Professor Pemraj Sarda College, Ahmednagar.

- **Kartik Sally**

  Kartik Sally is Assistant Professor, Guru Ramdas School of Planning, Guru Nanak Dev University, Amritsar.

- **Joy Karmakar**

  Joy Karmakar is Faculty Member, Department of Geography, Serampore College, Hooghly.

❐ ❐ ❐

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

M. N. Roy Human Development Campus, Plot No.6, 'F' Block,
TPS Road No.12, Bandra (E), Mumbai – 400051.
Tel : +91-22-26571713 / 4, 6180 5600 Fax : +91-22-26572115
E-mail : aiilsgquarterlyjournal@gmail.com, info.algq@gmail.com
Website : www.aiilsg.org