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Propositions for Solid Waste Management Practices in India: Derivations from Patna Municipal Corporation

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Abstract – The present study is exploratory and pragmatic in nature and provides detailed insight of the functioning of solid waste management in Patna Municipal Corporation. Its looks into the functioning of PMC with respect to composition of labour force, Occupational related health/disease and availability of public health facilities to workers. It lastly provides the recommendations and policy implications for solid waste management practices in PMC for further improvement. The lessons derived from PMC could be implemented in a larger context in India.

Key Words: Solid Waste Management, Occupational Disease, Public Health

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1. INTRODUCTION

Municipal solid waste management is the very essential services that a city provides. In many countries including developing and developed, municipal solid waste management service is local government's responsibility. MSWM (Municipal Solid Waste Management) is also the indicator of healthy urban metabolism and infrastructure of the city. If cities are not able to manage its wastes efficiently, it's hardly possible to manage more complicated services and provision like transportation, slum, energy, education and health. Inefficiently and unscientifically managed solid waste has very disastrous impact on public health, workers health and environment both locally and globally. In addition to this, indiscriminate disposal of MSW in open dumpsites within the urban area has proved to be very dangerous, risky and unsafe for the population residing nearby dumpsites. They can pose health threats and damage to environment in urban areas. Inappropriate MSW practices are a great danger to public health and the environment. Open dumping of garbage's on street and other malpractices related to solid waste management practices degrade the quality of air, water and land and expedite the proliferation of pathogens and vectors that carry diseases. It directly or indirectly causes adverse effect on population residing there, conservancy staffs and all those scavengers and municipal solid waste workers who works in this sector. This makes the entire process more complicated, risky and hazardous.

2. WHAT IS SOLID WASTE?

Adegoke (1990)[1] defines "wastes as a substances and materials, which are disposed of or are required to be disposed of according to the provision of the national law". In the same way, Miller (1991)[2] defined waste as any unwanted or discarded materials that are solid, liquid and gaseous. It includes, waste is that material that no longer has any economic value to the person who be the owner of that stuff. Solid waste is broadly comprised of non-hazardous domestic, commercial and industrial refuse including household organic waste, hospital and institutional garbage, street sweepings and construction wastes (Zerboc 2003).[3]

According to the manual on municipal solid waste management by Ministry of Urban Development, Government of India, solid waste is defined as discarded solid material of manufacturing processes and industrial operations, waste materials generated by the construction, refurbishment, repair and demolition of houses, commercial buildings and other structures, wastes that are collected from streets, walkways, alleys, parks and vacant lots, bulky household wastes which cannot be accommodated in the normal storage containers of households, wastes are those arising from institutions such as schools, universities, hospitals and research institutes, solid wastes that originate in offices, wholesale and retail stores, restaurants, hotels, markets, warehouses and other commercial

establishments, wastes that originate from single and multi-family household units.

The definition of solid waste is given in the European Union Council Directive as "Waste that predominantly consists of material that has the properties of solid". The Organization for Economic Co-operation and Development (OECD) defines solid waste as useless and sometimes hazardous material with low liquid content. Solid wastes include municipal garbage, industrial and commercial waste, sewage sludge, wastes resulting from agricultural and animal husbandry operations and other connected activities, demolition wastes and mining residues.

3. SOLID WASTE MANAGEMENT PRACTICES IN PATNA MUNICIPAL CORPORATION

Patna is one of the fastest growing cities of India with least regulatory framework and without Planning for Future. Ever increasing population of Patna is complicating the problem and making the condition more difficult. Due to increasing population of Patna City its waste generation is also increasing. The present population of Patna is more than 16 lakhs.

Patna city is divided into several administrative units for the purpose of planned development and for better urban metabolism. It includes Patna Regional Development Authority (PRDA), Patna District, the Patna Urban Agglomeration Area (PUAA), and the Patna Municipal Corporation (PMC). The PRDA is roughly 235 square kilometres in area and consists of three districts of Bihar: Patna, Saran, and Vaishali (see figure 1).

Source: http://www.mapsofindia.com/maps/bihar/patna-city-map.htm.

The per day waste generation is very high and it's up to the condition where it is very difficult to manage properly. This herculean task is further turn into more challenging and clumsier when urban local Bodies have limited funds and shortage of Man power. In Patna Municipal Corporation both problems are very severe it has fund crisis as well as man power crisis.

4. COMPOSITION OF WORKERS IN PMC

In Patna Municipal Corporation, workers are classified into two categories (a) Daily Wage (b) Permanent. Among total worker 92.2 percent solid waste workers are 'Daily Wage Workers' and 7.8 percent workers are 'Permanent Workers'. Daily wage workers are in Majority constituting 92.2 percent in entire workers population. In PMC about 92 percent solid waste workers are daily wage employee and their monthly income is very less; ranging from Rs. 6500 to Rs. 8500. In addition with this, they are not entitled for any necessary institutional support and allowances.

5. OCCUPATIONAL HEALTH RISK AND PUBLIC HEALTH PROVISIONS

There is certain occupational health risk associated with workers involved in managing solid waste management. Occupational diseases cannot be reduced and minimized without various public health provisions and supporting facilities such as PPE, regular health camps and check-ups and proper institutional support to the workers. This study has investigated various public health care facilities and institutional provisions to waste workers of PMC. In PMC public health care provisions and institutional provisions are very poor and insufficient.

Only few permanent workers (about 7.8 percent) are having different public health care facilities such as health-card, insurance, doctors to consults, PPE etc. The majority of workers are completely devoid of all these facilities. Due to this unavailability of various mandatory public health care provisions and institutional apathy, they are subjected and exposed to various health risks, diseases and illness.

The major diseases reported were hook worm and gastrointestinal infection, dermatological diseases and musculoskeletal diseases and puncture wounds. Little less than two-third workers are suffering from dermatological diseases. Nearly half of workers are exposed to musculoskeletal diseases and about 52 percent workers are having puncture wounds.

6. QUANTIFICATION OF EXPENDITURE ON HEALTH

For better analysis of the economic impact of occupational diseases among solid waste workers of PMC quantification of expenditure on health has been done. Under the scale of Rs. 6500; about half of the casual's workers are spending Rs. 500 and below on their health and their monthly income lost is about 7.69 percent. Whereas in the same category about 40.84 percent daily wage worker are spending about Rs.500 to 1000 on health per month

and their monthly income loss of 15.38 percent. In the highest pay scale category of daily wage workers, about one third workers are spending Rs 1000 to Rs.1500 as health care expenditure and their monthly income lost is about 17.64 percent.

Another important aspect of present study was to investigate the impact of health on income and livelihood of the solid waste workers. In this study we find that the highest man days lost was 3.5 days and about 11.27 percent workers are losing 3.5 days of productive work and 11.63 percent of income lost. In Pay scale Rs. 6500 hundred highest frequent man days lost was observed is 1 days. About 28.17 percent workers are having one day man days lost. The percentage of Monthly Income lost is 3.32 percent. Second frequent man days lost is 1.5 days. Constituting 21.13 percent of waste worker and their monthly income lost is 4.98 percent.

7. RECOMMENDATIONS AND POLICY IMPLICATIONS FOR SOLID WASTE MANAGEMENT

In general, the present research work proposes that primacy should be given to monitoring those hazards and risk threats that are well acknowledged, common, substantial, extensive, pervasive and wide spread, and for which effective and adequate risk reducing strategies are available. The increasing amount of solid waste generation and sharp increase in occupational diseases associated with MSW particularly in Patna is unblemished example of urbanization induced mal functioning of MSW.

The study recommends that substantial increase in government waste taxes (polluters pays) would effectively minimize the waste generation along with low occupational health hazards and minimum Environmental Contamination. This will also provide a very good waste minimization and significant health benefit to Patna Municipal Corporation and their Solid Waste workers (Conservancy staffs). Government action and serious effort of Municipal Corporation in association with multiple stakeholders, to reduce the waste and its hazardous contents would also attain substantial health benefits to workers and resident of Patna. It will also increase the ecological health and aesthetic beauty of the City.

The waste minimization should be one of an inclusive and comprehensive strategy for the control of occupational health and diseases risk and Pollution. The overall plan and strategy for sustainable and healthy waste management would be based on a combination of community wide interventions, such as waste minimization, waste reduction, treatment – based intervention such as freezing toxicant before dumping, treated waste discarding, use of cemented dumping sites and last but not the least, is livelihood based solid waste management focusing on workers income, ensuring maximum periodicity of work and sound health so that he can earn his livelihood without any obstacle with no diseases and less man days loss. For many of the occupational health risk and hazards the best remedy seems to be in the coordinated agreement between the common public, solid waste experts and public health Practitioners. In PMC, Risk understanding may need to be strengthened among the general public, waste workers, municipal administrators, contractors, politicians, media, and public health practitioners as well as research and academic community. More normally, the paper proposes following recommendations for policy implication-

- Governments, specifically Health ministries, should perform a very alert, tuff and robust role in articulating and formulating risk prevention policies, encompassing additional support for scientific research, enhanced surveillance systems and better access to universal information.

- A sense of balance is required and necessary among government, community and individual actions. For instance, government and community action should be supported by non-governmental organizations, local groups, media and others. At the same part, individuals (workers) should be allowed, empowered and encouraged to work safely and capable to take life enhancing decision for themselves.

- Countries must give top most priority to evolving sharp, effective and dedicated policies for the prevention of increasing occupational health risks among solid waste workers.

- Cost effective analysis should be applied to identify priorities interferences such as High, Medium, low to prevent or reduce risks, with maximum priority given to those interferences that are cost effective and economically feasible.

- Inter sectoral and international partnership is required to minimize minor occupational health risks such as unsafe water and lack of awareness, should be encouraged and enhanced.

- Equally international and global co-operation should be encouraged and strengthened to improve risk management and understanding health threats related to Solid Waste.

- An atmosphere of faith and confidence is required between government, functionaries, public, health practitioners and media. This trust has to be nurtured,

developed and fostered. The importance of developing trust between all stakeholders has great inferences for transparent government and its role in civil society. Municipal corporation need to be seen to be autonomous and independent from political pressures. Press and mass media need to be free to examine risks and broadcast their findings.

- Occupational diseases cannot be reduced and minimized without various public health provisions and supporting facilities such as PPE, Regular health camps and check-ups and proper institutional support to the workers. In PMC public health care provisions and institutional provisions are very poor and insufficient.

Thus, the lessons derived from the PMC and the policy suggested would be implemented in a larger context in Indian Peninsula for better solid waste management practices.

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