



DEVELOPMENT OF OPERATIONAL ACTION PLAN FOR A TYPICAL SYSTEM TO IMPROVE SOLID WASTE COLLECTION AND PICKUP SYSTEM

PRESENTATION OBJECTIVES

- Regulate operational and technical processes by improving and implementing a sustainable process for collecting and pickup waste; organizational stages are:
- Stage one: Current status of solid waste management (technical data)
- Stage two: best implementation of process management
- Stage three: Analysis
- Stage four: Solutions
- Stage five: Action plan
- Stage six: Monitoring and Evaluation



STAGE ONE: CURRENT STATUS OF SOLID WASTE MANAGEMENT (DATA)

- Identify sites of transfer stations and recycling plants and describe waste landfills
- Waste generated and its sources
- Methods and types of collecting waste (manual, mechanical, use of containers, etc.)
- Approach used in determination of trash truck routes
- Organizational structure, responsibilities, and authorities (vertical and horizontal relations)
- Available human resources (engineer, technical supervisor, foreman, and cleaning staff)

STAGE ONE: CURRENT STATUS OF SOLID WASTE MANAGEMENT (DATA)

- Number and type of available truck and machinery, as well as their size and maintenance programs
- Financing and realized revenues
- Current performance indicators according to waste collection and pickup standards.

STAGE ONE: CURRENT STATUS OF SOLID WASTE MANAGEMENT (DATA)

- Challenges facing Municipality Directorates in collection and transfer of waste according to the following aspects:
 - Work force
 - Technical aspect (infrastructure, machinery and their maintenance, etc.)
 - Financial aspect
 - Legal aspect
 - Administrative aspect
 - Social aspect

BEST IMPLEMENTATION OF PROCESS MANAGEMENT

- General standards to calculate waste management needs for specialized machinery and cleaning staff
- (2-3) street sweeper for each 100,000 people
- (20) specialized cleaning machinery for each 100,000 people
- One sprinkler truck for each 100,000 people
- (500) cleaning staff for each 100,000 people
- (3) trash bag for each residential unit per a week.

BEST IMPLEMENTATION OF PROCESS MANAGEMENT

- Adopted method for developing daily plans and organization of work
- Study of the targeted area, identify needs, distribute resources as per population density, identify optimal trash trucks routes and schedules and number of tours.
- Payment should be made for rented trucks and machinery according to tours and amount of waste as per productivity of the truck.
- Prepare an emergency group (machinery and workers) to be under disposal of the person in-charge
- Improve communication between trucks and emergency central operation center.

BEST IMPLEMENTATION OF PROCESS MANAGEMENT

- Methods used in collecting and pickup all types of waste
- Identify method for best collection of waste from households, facilities, hotel, hospitals, streets, etc.
- Method of distribution of waste bags.
- Setting up specialized committees for collecting data (statistics departments, aldermen, mayoralty, municipal council, etc.
- Distribute trash bags according to templates designed for this purpose at an average of three bags or each five individuals per week (households of more than five members should be considered)

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT

- Method used to tackle debris and scrap metal
- Prepare specialized land for collecting and heaping up scrap metal; special committees are set up for this purpose that should get all approvals.
- Launch campaigns to collect and transfer scrap from residential and industrial areas to the collection site. Such work should be done systematically for optimal use of the site.
- Approach concerned parties to make use of the scrap metal as a raw material

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT

- Method used to address swamps and wetlands
- Determine sites and areas according to priority that are in need to be addressed. Study reasons behind formation of these swamps and wetlands and make every effort to address them in coordination with other directorate sectors. Select best time (evening) to work.
- Method used to sweep and wash streets and sidewalks
- Two methods are used to sweep and wash streets and sidewalks
- Method of sweeping streets by using trucks (sweepers+ sprinkler trucks)
- Method of sweeping street by cleaning staff (one cleaning staff for each 3 Km. (Each staff is supplied with hand cart)
- Washing of sidewalks is done with a tool supplied with water pumps and hose.

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT

Method used in cleaning parks and traffic islands:

- Coincide work of clearing staff with irrigation of plants

SITE TO BE SERVED	SERVED AREA	DESCRIPTION
Traffic islands and road sides	3-5 Km/day	Cleaning staff
Parks and traffic islands not served by irrigation networks	5 acres/day	Cleaning staff
Parks and traffic islands not served by irrigation networks and agricultural tools	25 acres/ day	Cleaning staff

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT

- Method used in distributing and identifying routes of trash trucks
- First: obtaining an aerial map for service sector
- Second: identifying main and secondary roads along with their lengths, number of houses and commercial centers
- Third: waste amount is calculated according to number of households and amount of waste per capita; and supply of containers
- Fourth: determine available trucks used in a certain sector
- Fifth: Tentative routes are selected to be used for a certain period of time (a month at least), if the sector can be divided into neighborhoods.

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT (AFTER IDENTIFYING TRUCK ROUTES)

- sixth: identify elapsed time for collecting waste from the sector based on tentative agreed-upon routes (each route for 3 days)
- Seventh: when drawing routes, schools, stores, malls, hospitals, etc. should be taken into consideration. Collection is to be done after rush hours or at night.
- Eighth: analysis of results is done and best route is selected (the shorter where waste collection is done quickly)

When determining routes, the following should be considered: generated waste, length of streets, number of residential units, whether there are trash containers, place and size of main containers.

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT

- Method used in developing machinery maintenance plan and templates used
- Maintenance management is divided into:
 - A- unplanned maintenance: urgent maintenance, repairing urgent defects
 - B- planned maintenance; it is divided into:
 - Expected maintenance: maintain of unseen defects
 - Corrective maintenance: change parts based on hypothetical age; planned repair.
 - Preventive maintenance; simple repairs

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT (FOLLOWS MAINTENANCE PLANS)

- Establish a full central workshop and train its staff. It includes welding unit, forge unit, fuel and oil unit, wash and lubrication unit, stores, garage for machinery, tools, spare parts and equipment
- Set up a mobile maintenance workshop supplied with all equipment, tool and specialized staff
- Form committees for detecting defects, purchase of equipment, machinery repair, assessing damages and identifying derelicts.

STAGE TWO: BEST IMPLEMENTATION OF PROCESSES MANAGEMENT (FOLLOWING MAINTENANCE PLANS)

- Develop forms (identify truck defects, repair, check, regular maintenance), oil and fuel, battery and wheels, truck movement.
- Method used to supply fuel for truck
- Method of overall distance: it identifies amount of consumed gasoline (5-7.5) L/30Km
- Method of calculating working hours of specialized trucks (20L/8 working hours)

STAGE TWO: BEST IMPLEMENTATION OF PROCESS MANAGEMENT

- Method used in renting truck and machinery for trash pickup and transfer
- Identify actual need of required machinery and trucks by preparing a bill of quantity developed by a committee to be formed by citizens for this purpose (solid waste, machinery, financial issues); safety, environmental and quality requirements must be considered).
- Identify required sites of rented trucks, truck routes, number of transfer, required amounts. A template is developed to calculate charges.

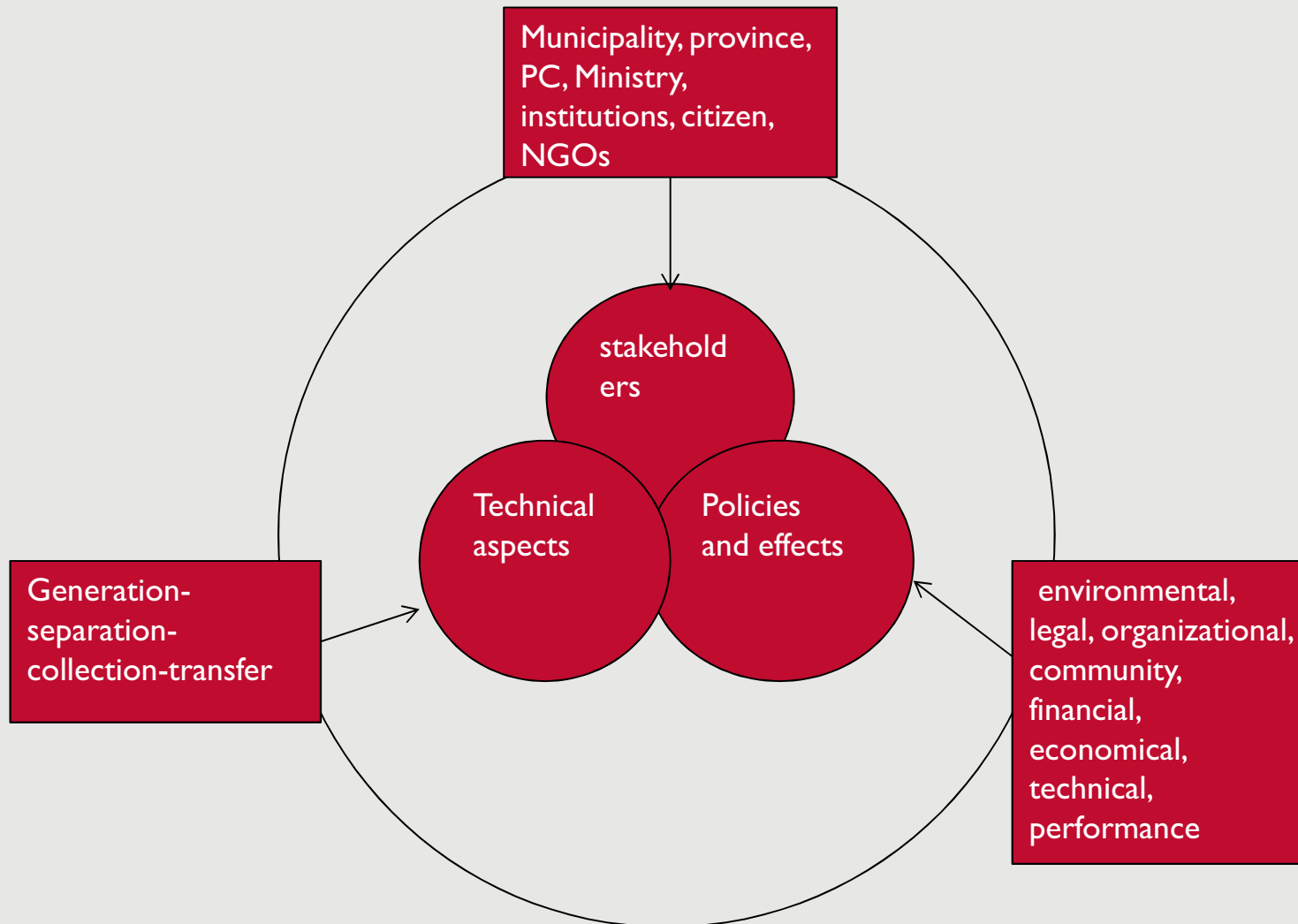
STAGE THREE: ANALYSIS

- Analysis and comparison processes between actual need and as-is situation (available resources)
- Diagnose and identify strengths and weaknesses of resource management
- Diagnose and identify technical aspects in the system in a detailed manner (waste generation, separation, collection, transfer, etc.) and outline the effect of stakeholders in each stage
- Identify stakeholders- individuals, groups or institutions interested in and related to trash collection service- and outline their role and where they are linked to the system.

STAGE THREE: ANALYSIS

Policies and effects: They include organizational and financial work mechanisms), service cost, revenues, allocations, shortage, increase of revenue flow)- definition and determining required change aspect to be consistent with an effective system (for example, environmental, legal, organizational, social, financial and economical, performance, technological)

INTEGRATED AND SUSTAINABLE SYSTEM



STAGE FOUR: SOLUTIONS

- Required processes to improve service delivery performance; these include solutions to address obstacles and challenges

STAGE FIVE: ACTION PLAN

- Develop an action plan to strengthen and enhance an effective, responsive and effective system

STAGE SIX: MONITORING AND EVALUATION

- Entities/parties involved (Stakeholders + joint Monitoring and Oversight team)
- Templates:
 - Follow-up template
 - Weighing template
 - Performance evaluation measurement templates
 - Citizen satisfaction template
 - Sector performance evaluation template.

STAGE SIX: MONITORING AND EVALUATION

- Site visit report (review report template and improve it with the group)
- Feedback (social media and complaint boxes)
- Maintenance monitoring template
- E-monitoring programs
- Regular updating of service indicators using performance standards

Thank you



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