Urban Services Planning
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Lecture 15
MSWM Plan Preparation Part III

Welcome back. In Lecture 15, we will complete the third part of Municipal Solid Waste Management plan preparation.

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The different concepts that we will cover are Municipal Solid Waste Management Plan for urbanite local bodies, institutional structure and manpower requirement, Municipal Solid Waste Management plan implementation, statutory clearances for MSWM facilities, action plan and DPS for MSWM. Cost assessment, we will talk about full cost assessment, MSWM revenue and public Private Partnerships and Contracting Services.

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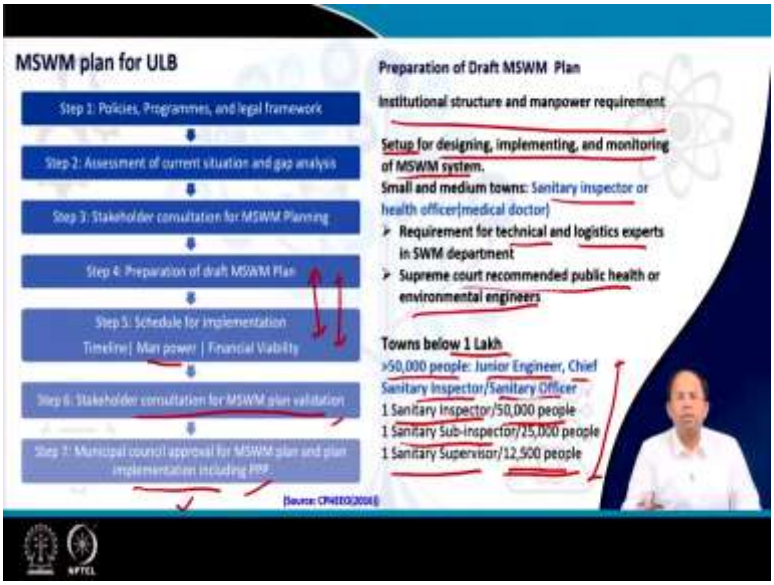

So, the figure on the left shows the seven steps together. So, we have already discussed the first four steps where step one is about policies programs and legal frameworks which are required to be followed in an urban area, assessment of the current situation, the baseline and the gap analysis. Third part is stakeholder consultation for MSWM flooding. So, in earlier lectures, we have discussed how to do that or how which stakeholders to incorporate. So, we have already covered it in overall service planning.

Then Step 4 is preparation of draft MSWM plan. In last lecture, we have discussed on this. Step 5 is schedule for implementation, that is how it has to be implement, what time frame and what manpower is required, financial viability and all. So, more or less, there are some overlaps between these two. So, both are done together.

Then finally once the draft plan is prepared and this implementation plan is also prepared, then we take this plan to stakeholders, right, and we, and they validate the plan, that they agree with the plan, then we can we do not need to modify, if they do not agree, they need to go back to the table and modify the plan. And we have also discussed about this willingness to pay studies, acceptance studies and how to conduct those, that we have already discussed.

Then Municipal Council approval for MSWM plans. So, once everybody agrees, then the Municipal Council also approves the plan and implementation, and thinks about how to

implement this, that means, some, again, some amount of decisions on which part of the services or which activities has to be contracted, given for Public Private Partnerships, these are already decided in the planning process or the draft planning preparation.

Here, the final selection of agencies or final selection of private partners, that is conducted by the tendering process and the job is assigned, right. So, that is what is done in step 7. So, today, we will, in this lecture, we will discuss on all these aspects and primarily we will start over here as well. Even though we have talked about the draft plan, there are some aspects which overlap between both preparation of the draft plan as well as the schedule of implementation.

So, as you understand, that manpower is a important thing that we have to determine. So, institutional structure and Manpower requirement has to be estimated for future for, because the plan that we will propose requires different types of people or different number of people or manpower to actually help in implementing it. We can expand the services in many urban areas. So, obviously that will require, we will require more manpower to do that.

So, this setup, so institutional structure and manpower requirement this helps us in setup for designing, implementation and monitoring of MSWM system. So, this helps us in designing the overall structure, how design, implement and monitoring of this overall management system will happen.

So, what we have seen is we have learned about the general organizational structure where we have talked about the legislative bodies and the executive, the execution part that is the, the engineers, the sanitary officers, Health Officers, the ones who are actually in the field, doing the actual work, and then there is elected members and all who takes the decisions and all. So, we have learned about this organizational structure in earlier lecture.

So, now going into the mostly on the, concentrating on the execution part. So, for different kinds of cities or different scale of cities, there is requirement for different kinds of staff members to execute this kind of plans that we are preparing. So, in the current setup, what we find that in most small and medium towns or even in some fairly large

towns there is a sanitary inspector or sometimes there is a Health Officer who is none other than a medical doctor.

So, a medical doctor does not have expertise in the technical side of things, in the technologies or the processes that are utilized, neither he has expertise in the logistics part, that is what kind of service, how the service has to be provided. So, that is why there is a recommendation of engineers who should be part of this solid waste management process or solid waste management departments in our local bodies.

So, Supreme Court recommended that public health or environmental engineer should be also brought in, in this particular system. So, some of these recommendations are as follows. Like for example, towns below 1 lakh which are very small towns and where the number of people is more than 50,000, there should be a Junior Engineer at least, somebody who is experienced, but a Junior Engineer also is possible, or it could be a cheap inspect, say, who can be and also a chief sanitary inspector or the sanitary officer for that particular ULB.

So, in addition to that we, require one sanitary inspector per 50,000 people, one sanitary sub inspector for 25,000 people. So, that means under a sanitary inspector, there are multiple sub inspectors. And one sanitary supervisor for every 12,500 people. Now, under the sanitary supervisor are the actual sweepers. So, one sanitary supervisor for every 12,500 people. So, that is how many manpower that we will decide for an urban area, that is how we will decide.

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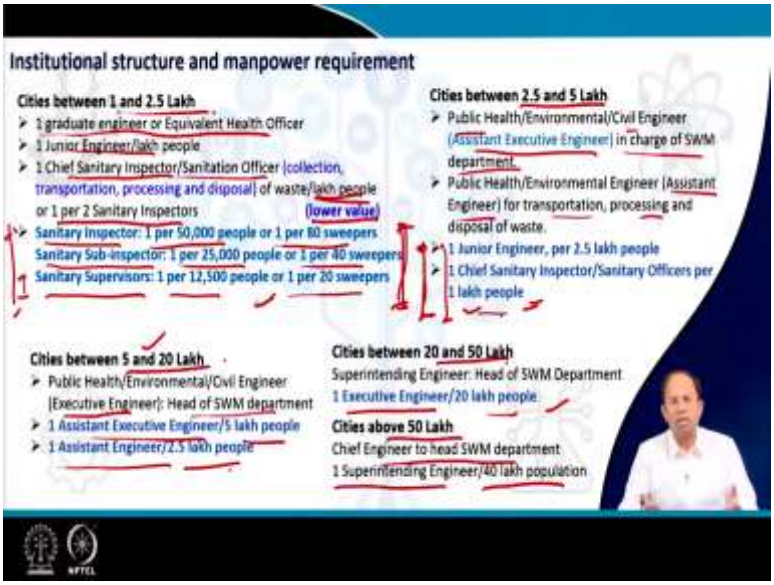

Now, for larger cities, for example a city between 1 to 2.5 lakh, we see that it is suggested that one graduate engineer or equivalent Health Officer is engaged, one Junior Engineer and usually the estimate is for every 1 lakh of people, there should be one Junior Engineer. Then 1 Chief Sanitary Inspector or Sanitary Officer who will look into the actual collection, transportation, processing and disposal that is happening in a ward level.

For every lakh of people, like similar to this Junior Engineer, there is, along with the engineer, there is a Sanitation Officer supporting his work. And this, it would be, it could be for every 1 lakh of people we will have one, or one per two Sanitary Inspectors. That means for every 2 Sanitary Inspectors, there should be one of Chief Sanitary Inspector. So, we have to take whichever is the lower value among these two values.

Similarly, for Sanitary Inspector position has to be there for every 50,000 people or for one per every 80 sweepers, whichever is lower. Sanitary Sub-Inspector, 1 per 25,000 people or 1 per 40 sweepers, whichever is lower. And Sanitary Supervisor, 1 per 12,500 people or 1 per 20 sweepers. So, that, we have already seen this post earlier in the previous, in the smaller body. So, that is repeated.

So, as you can see that cities with a little bit more population, they require a more number of manpower compared to smaller city. Now, going to even larger city, 2.5 to 5 lakhs, so

this part will remain as same. This is, in addition to that, we have one Chief Sanitary Inspector over here at this level or Sanitary Officer per 1 lakh of people. So, in addition, we will have all this ones which are marked in blue.

Public Health Environmental Engineer or Assistant Engineer position for transportation, processing and disposal of waste, so he can help in designing the system. And a assistant executive engineer who would be in charge of the solid waste management department. He could be a Public Health Engineer or Environmental Engineer or a Civil Engineer.

Similarly, for cities between 5 to 20 lakhs, we can see that more or less every, this group of people and this group of manpower, this is common. In addition, we have got public and Executive Engineer who is head of the Solid Waste Management Department who is again an Engineer by trade, and one Assistant Executive Engineer for every 5 lakh people and 1 Assistant Engineer for every 2.5 lakh people.

So, the rest will be same. So, this blue marked manpower from both this table and this table both would be included over here as well. Now, finally for cities between 20 to 50 lakh, there is, the head is a Superintendent Engineer who is head of the Solid Waste Management Department. And under, him there is one Executive Engineer for 20 lakh people. Everything else remains same as this other one.

And cities which are very big, above 50 lakh, Chief Engineer heads the Solid Waste Management Department and he has got more than 1 Superintendent Engineer, and that is for every 40 lakh people, he has got 1 Superintendent Engineer. And everything else is as per the city between 20 to 50 lakh. So, you see that as the city grows, the organizational structure or the way to manage it also changes, and accordingly we have to determine what sort of staff or manpower is required to manage that.

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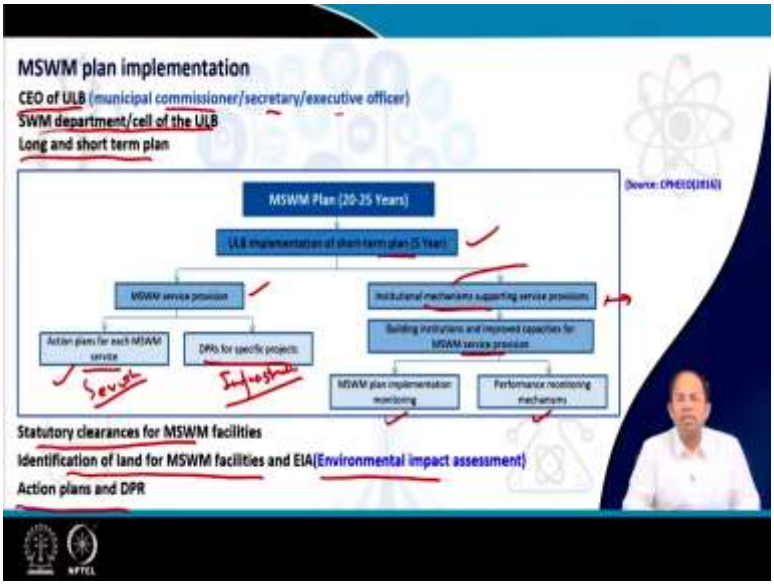

So, for implementing a Municipal Solid Waste Management plan, as now after draft plan we have, and after stakeholder prepare this consultation, we have to actually implement this. So, CEO of the urban local body which is the Municipal Commissioner, Secretary or Executive Officer, he is the one who is in charge of implementation of the plan that is being prepared.

So, Solid Waste Management Department or cell of the ULB, so that means in each ULB there is a Solid Waste Management Department or a cell. So, he is, with this is the actual body which does the job. And based on the long and short term plan recommendation, they will conduct or implement this particular plan.

So, as you can see in this particular figure. So, for every five year period which is a short term plan, we have to determine two aspects. One is the, we have to implement the municipal service. And this service is again two parts, one is the act service and the other has some infrastructure provision. So, one is service provision, and the other is infrastructure provision.

So, for service provision, usually we prepare action plan whereas for infrastructure or facility or some setup of some landfill site or some processing facility, waste processing facility or recycling facility, we usually create DPRs or Detailed Project Reports. So, these are the two differences. Similarly, we have to determine in the institute, in the

administrative part, what are the institutional mechanisms which has to support, which has to be framed to support this kind of service provision.

For example, if you remember, we showed you in case of decentralized application in case of Pune for Solid Waste Management in Pune, where compost was handed, where waste collection was done at the local level by a self-help group, in that particular case, we have to have a organizational structure which supports that kind of activities by contract, by work which is done under contract by some other agencies.

So, institutional mechanisms also has to support that kind of service provision that we will suggest. Then building institutions and improve capacities for MSW service provision, that is obvious. And there has to be a implementation monitoring mechanisms, that is, we have to devise how do we monitor that because sometimes the service is provided by via contract by another agency. How do I monitor that? What rules, what sort of guidelines we should have for that?

And what are the ways to monitor that and what sort of mechanisms we should have called monitoring this. So, this is how this plan is actually implemented. So, in addition, before we even start the implementation of the actual processes and all or the services and all, we have to first take statutory clearances. And this is particularly important for all this infrastructure or facilities that we create.

So, that is if I have to create a waste to energy plant, I have to take clearances for that right. So, and not only clearances, this is one part of it. The other part of it is identification of the land for this setting of this facilities. And in addition to the clearances which are required, we also have to take environmental clearances in form of EIA, from the environmental agencies, we have to take clearances.

And we have to develop this environmental impact assessment reports. And from there, we have to, based on those particular reports, you will get clearances from environmental agencies. And finally, based on, based on this clearance, after we get clearances and all, then we have to prepare our action plans and the final DPRs for the project.

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So, let us take a look at the different kinds of clearances that we need to undertake. So, based on Solid Waste Management Rules 2016, we have already seen that there is a Form 1 in case the Solid Waste Management Facility handles more than 5 metric tons of waste per day or same goes for a waste to energy plant. If it, then we have to fill up Form 1 and we have to send it to the state pollution control board or the pollution control committee of that state for clearance.

So, that means they will give us clearance and then only we can undertake that kind of a new facility or we can construct that kind of facility in an urban local body. So, as per EIA Notification, 2006, MSW handling, storage, treatment and disposal comes under Item 7 d and 7 I. So, obviously, we have to take clearances from the environmental agencies as well. So, clearance from State Level Environmental Impact Assessment Authority, that has to be taken before we can go ahead with this kind of action plans or DPS for this particular aspects.

So, in addition to these two basic clearance, we have to take clearance for other things as well like for Water Prevention and Control of Pollution Act, that is the other clearance we require. The Air Pollution Act clearance from Airport Authority, Fertilizer Control Order clearance in regards to setting our compost plants. Then and use clearance from Revenue Authority. State (Elec) because we cannot just set up a solid waste management, sorry, a

landfill site in any area. We have to follow many rules, many laws and we have to take clearance from the Revenue Authority to determine which are the appropriate locations.

Then State Electricity Authority clearance for grid connectivity, suppose we are generating energy from a waste to energy plant. So, this energy has to be sent to the grid, so grid connectivity clearance. Public Liability Insurance Act. So, in case of some accidents and all, the Industries Act, the Factories Act, the Motor Vehicles Act, Petroleum Act, Energy Conservation Act, these are all the different acts which also states certain amount of clearance has to be taken in regards to certain activities. So, those as per requirement, we have to take those.

So, in addition to this statutory clearances, there are other approvals that are also required to conduct this kind of DPRs or service action plans. So, in most cases, in case I am setting up a facility, of course I should have the Site Possession Certificate, Bank Appraisal of the project or debts or loans that we are taking, Water Supply Agreement to this particular site, Power Purchase Agreement, that means somebody will buy the power that will generate in a waste to energy plant if we are setting that up, Municipal Solid Waste Supply agreement that means if I am setting up a landfill site, I should first have agreements with the municipal authorities that that garbage has to be supplied to this plant by bandit. So, that agreements has to be taken up. So, all these agreements needs to be first executed before you start preparing the plan, or start implementing the plan.

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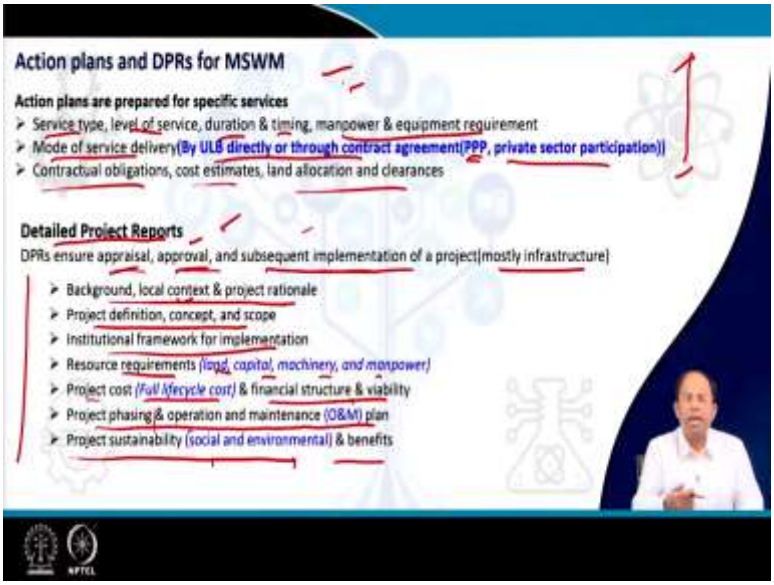

Now, coming to plans, there are two kinds of plans, action plans and DPRs. So, action plans are prepared for specific services and it varies as per the service type, level of service, how good quality of the service that we are providing, the duration of the service for how long we will provide that service, timing, at what time of the day the service will be provided, manpower and equipment requirement.

So, when we provide a door-to-door service, collection service all these aspects needs to be thought of or designed in the plan and then we have to execute that. During execution, we have to consider all these aspects. The mode of service delivery, that should the ULB directly deliver this service via its own staff, own equipment or it should be delivered via contracting agreement, that means municipality will give this job to a private sector entity or a private public partnership entity where this, form where jointly entity is formed with the by the private and the, agency and the government and that entity will provide this service.

Then what are the contractual obligations? If this kind of contracts are created, of course there are contractual obligations that means what has to be done in the contract. So, that, those are listed. Cost estimates, land allocation and clearances for all this. So, all this thing needs to be considered when creating this kind of action paths. Similarly, when we create DPRs, and particularly DPRs are for facilities, infrastructure and so on.

So, DPRs ensure appraisal, approval and subsequent implementation of a plan. So, that means any kinds of infrastructure that is created, DPS are first created so that we can appraise, approve and implement that particular facility. So, it is the detailed plan saying why it is required, what sort of things has to be done to do that or how do I get from finance and all those things, and finally, how to implement or what sort of clearance is required, the entire implementation plan is part of this DPR.

So, these are the two ways we can actually, we can, these are ways to prepare the plans of course. But at the same time this helps in the project implementation. So, in a DPR, what we include are background local, background local context on the project rationale, what is the background of this particular work that we are trying to do or the, what is the local context? According to that, we need to modify our recommendations. And the rationale, why do we need to do that? Why do we need to do this particular project?

Then, we define the project scope, what things should be done, the concept of the project, the institutional framework to support its implementation, manpower requirements for land, capital, machinery and manpower. Project cost, usually we go, we estimate the full life cycle cost. We will talk about that subsequently. Financial structure of this particular, that we will follow, and the viability of that particular financial structure. Financial structure is the revenue and the cost calculations and all this.

Project phasing and operation and maintenance plan. So, first, how to phase the project, if there are different, it has to be conducted over different phases. And the operational maintenance plan. And project sustainability, both social and environmental aspects and the overall benefits of this particular plan. So, a DPR and a action plan, these are part of the overall municipal plan, but when we create a draft plan for the municipality, it looks into the overall municipal, how we should provide municipal solid waste management services and all.

But this action plan or detailed project reports are for specific parts of that particular draft plan or some specific projects or specific services or specific infrastructure that we have to create. So, these are part of the planning process, but because these are actually given to some agencies or some companies or private bodies to create this kind of facilities or

create this kind of, or provide this kind of services, so those are the agencies or those are the entities which will actually create these kind of plans.

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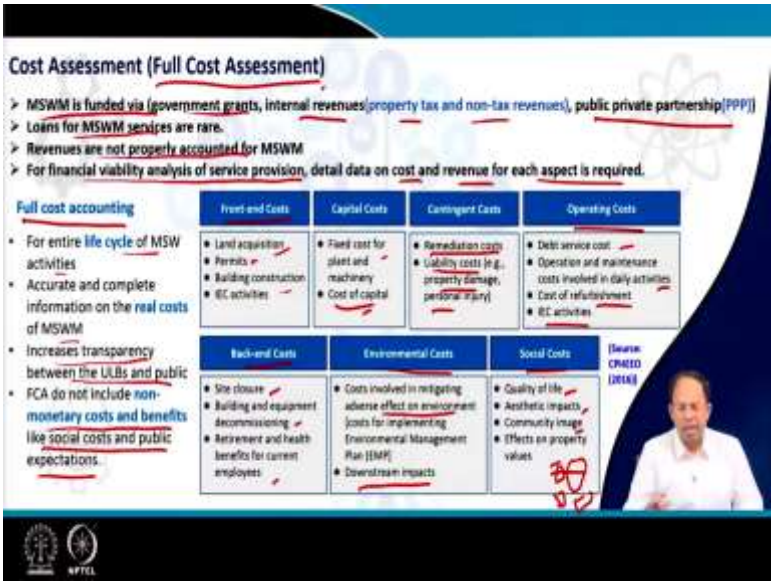

So, now coming to cost assessment, whenever we are doing any kind of plan preparation, we have to also do the cost assessment, and usually, when we do cost assessment, that means we check about the viability of the project, we check about how much is the overall cost of the system, what is, and we, and of course we will look into the revenue aspects as well. So, usually, when we talk about cost assessment, what happens, sometimes we miss on lot of cost. So, we have to do full cost assessment. I will take you through this different steps of a full cost assessment.

So, MSWM is funded via, as we have already learned, via government grants, some internal revenues like property tax, non-tax revenues, public private partnership mechanisms, and usually we find that loans are rare. That means usually a municipal body will not take a loan to provide a municipal service. And the idea is, some of the services are of course subsidized but most of, most of the services we have to generate some amount of internal revenue as well.

Like door-to-door collection, we have to collect some amount of charges. So, some internal revenues also has to be collected. So, these revenues are not properly accounted sometimes. That sometimes you miss out on those revenues. And for financial viability

analysis of service provision detailed data on cost as well as revenue for each aspect of service provision or infrastructure that we are providing for an urban area, that has three assessed.

So, what is full cost accounting, how it is different from standard accounting? Usually, we consider the entire life cycle of the MSW activities. So, that means, we look into not only, just some one aspect, but look into how it impacts other stages or other processes. Accurate and complete information on the real cost of MSWM. So, actually we do a more detailed estimate of costing. We divide the entire process into different steps and then calculate cost for each step.

Increases transparency between ULB in public, and this actually helps the public to also understand why we are spending so much money on such these things because the entire cost is broken up and given in details. And this full cost accounting do not include non-monetary cost and benefits like social cost and publication expenses. So, lot of benefits of our projects are not monetarily estimated but these are benefits which the society gains. So, these are not actually accounted for.

So, sometimes we say that, when we need to justify a solid waste management project or setting up of like a waste to energy plant maybe the cost and the money that we are going to make is not, they do not balance each other but what we can say is if I consider all the other benefits which it will result in, then we can say that the cost and the benefit will balance each other. But for the time being, in FCA, we do not consider all those other cost which we cannot calculate directly. So, everything which can be calculated directly, those are only considered.

So, let us see what are the different stages in which it is done. Like, when we do full cost accounting, we consider front-end cost, what it includes, the land acquisition cost for a facility, the different permits. To obtain those, we need to spend money. Building construction, IEC activities, the awareness campaigns. So, these are all front-end costs. This, we will incur them even before we start providing the service. Then capital cost, fixed cost for plant and machinery, cost of capital for taking a loan, we have to also pay interest. So, that is cost of capital.

Contingent cost, that means in case some problem happens, remedial, remediation cost, liability cost, example property damage, personal injury that results from our plan or our, our some service provision and so on. So, that we have to also take care of. Operating cost, debt service cost, operation and maintenance cost involved in daily activities, cost of refurbishment of some throughout the equipment or maybe a vehicle, IEC activities, awareness campaigns which is continued or carried on. So, these are operating costs.

Then back-end cost, that means at the end of the process also, when municipal service is not being provided, but site closer, like the landfill, once we fill the landfill, it has to be, and it has to be closed. We will discuss this in detail later on, these are technical things. But what it means that there are a lot of work that goes on even after this landfill stops receiving the waste. So, these are called back-end costs. That means this will be incurred once the service is not even being provided.

So, building and equipment decommissioning. So, we have to sell off those particular equipment and building which are not utilized or you have to recycle that. So, there is cost for that. Retirement and health benefit for current employees. So, you have to pay their pension and all. Environmental cost, cost involved in mitigating adverse effect on environment, and downstream impacts, like there may be some lot of issues that happens because of some amount of pollution that results from the landfill and all.

Even though, after all good intentions, after doing all good designs and proper engineering designs, sometimes damages happen, sometimes accidents happen. So, this may result in some environmental disasters. So, the cost for that. Social cost, quality of life, aesthetic impacts, community image, effects of on property value. Like suppose, you put up a landfill site in a certain area, the, all the buildings near that will lose value. So, who will pay for that?

So, all these are different cost which has to be considered for your preparing a plan. Then only we can determine that what is the overall cost that the government is spending and then we can decide on how to set up service charges, how to get, how much money to get from taxes and how do I set my tariff and so on.

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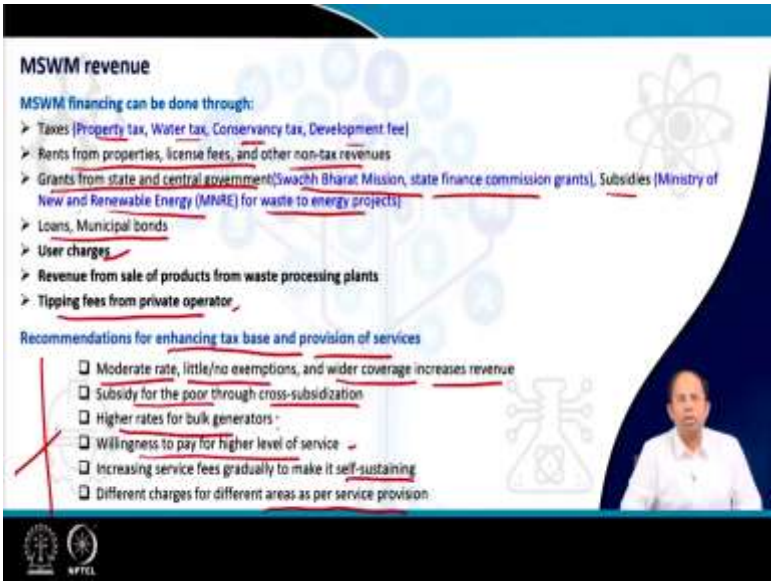

So, coming to amount of money that we can generate or the revenue part. So, of course, based on the cost, we have to also determine the extent of revenue that we have to generate from different sources because that is the cost that we have to meet by revenue. So, first of all the basic way of MSW financing is through taxes. And this include property tax, water tax, conservancy tax, development fee and so on.

Then range from properties, license fees and other non-tax revenues. Then grants from State and Central governments. We have already discussed about different grants and how these grants are actually given to the ULBs via the state governments. So, for example Swachh Bharat Mission, the state finance commission grants, these are the ones which are directly coming to the ULB.

Then subsidies can also come via some other sources like Ministry of New and Renewable Energy provide subsidy for setting of waste to energy projects. So, primarily we have to align the projects and all. So, that we can maximize on the amount of money we can get from the government. So, that is how the ULB should think about setting up certain kinds of facilities and all.

Then loans, municipal bonds are there but we have discussed this earlier, but usually in MSW, it is not that much taken up. User charge, this is a very big part of MSW, MSWM revenue because we have to generate as much money as possible from the service that we

provide. Revenue from sale of products from waste processing plants. There could be some amount of money recovered that way, and tipping fees from private operators. That means a private agency collects charges for door-to-door collection, but when they deliver this waste to a landfill site, they will pay again to the landfill operator. So, that is a tipping fee.

So, these are some of the revenues that we can generate. And to, so, once the revenue is, these are the ways to generate but how efficiently to collect this revenue for an urban area and what should be the recommendation for enhancing the tax base and provision of these municipal services, Solid waste services. So, that means we want to improve on the revenue collection costs. So, how do we do that?

So, one way to do that is to set up a moderate rate. Instead of charging very high values for services that we have provided, we charge a moderate rate. And, but we have little or no exception. That means everybody has to pay. And better to go for a wider coverage. That means we provide the service to as many number of people. So, that will overall this three steps will increase the revenue for a particular Urban local body.

Subsidy for the poor, but it should not be direct, it has to be cross subsidies. That means we have to charge more the rich and cross subsidize the poor. Higher rates for bulk generators. So, obviously different, there are residential generators bulk generators like institutions, large hotels and all. So, they should pay more money. Willingness to pay for higher level of service. So, we can ask people that if I provide better service will you pay higher values.

So, in that way we can generate more amount of revenue. Increasing service fee gradually. So, instead of abruptly increasing it, we gradually increase it and to make the entire process self-sustaining. And different charges for different areas as per service provided. So, if I do not provide good service, I will not charge more. So, as per the service I will provide, I have to charge that. So, these are some of the recommendations so that improve the revenue generation process in urban areas.

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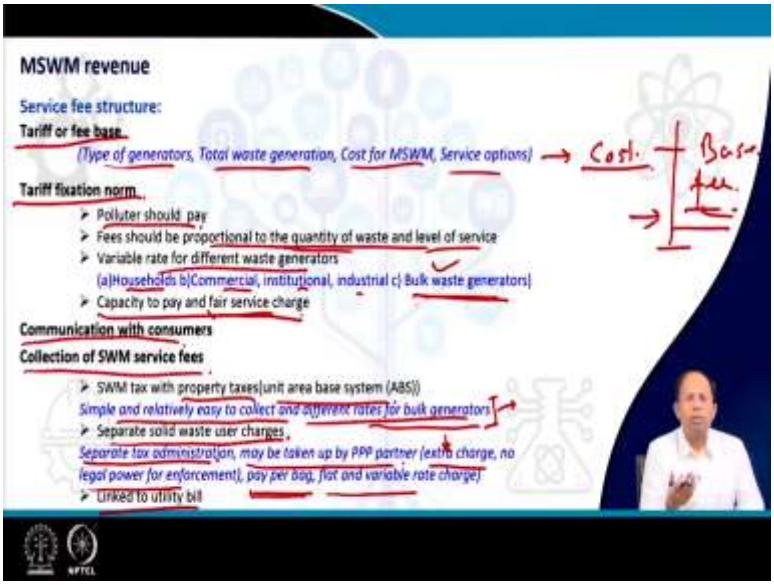

Now the other aspects are the service, fee structure that is how we should determine that what should be the fee structure for that door-to-door collection service or any other service that has been provided for municipal solid waste management. So, first step is to determine the tariff or the base fee. So, what is the base fee? Base fee, is means that what is the actual cost we are spending, and based on that what should be the cost per person that we should charge.

So, it depends on the generator types, waste generators in the urban area, total quantity of waste generated cost of the service and the service options, that means how good the service is or how frequent the service is. Based on those service option, we, actually this results in a cost. So, based on that cost, we can set up a base, that is, what is the minimum fee that is required to sustain these kind of services.

Then once that is determined, the base fee, we have to now determine what should be the actual charge we should charge. Maybe this is very high. So, that means we cannot take the entire money from the people, or maybe it is too less. Then I can also feel that okay, I can take money for other aspects of the service, not only door, the garbage collection part but also other aspects too via this service charge. So, that would be more than that, this.

So, tariff fixation norms, so how do I fix this particular tariff? There has to be certain principles following that. One is polluters should pay. That means whoever is generating

more pollution or more garbage, he should pay. Pay should be proportional to the quantity of waste and the level of service. So, if you are getting better level of service, you should pay more. If you are generating more amount of waste, you should pay more.

So, that means bulk generators and all should pay higher values. So, that means variable rate for different waste generators. So, bulk generators, like should pay more value. But in general households and commercial, institutional, industrial, they should also pay differently. So, household should pay less compared to commercial, institution and industrial. And then if I look into bulk generators which are, could be commercial or a market or an institution, but they generate very high levels. So, we can charge even higher values from there.

And finally, capacity to pay. Like I can charge money but if people are so poor, they are not able to afford. So, we have to set the charges fairly. So, we should think about the overall development of the city, the health of people and then we have to set up a charge. Then once this is done, we have to communicate with the customers. So, as we have discussed earlier also that even after a solid waste management plan is prepared, you have to take it to the people for their feedback. So, that is the step.

We take these charges to the customer and ask them are they willing to pay that amount of money or do they want some changes, and so on. And finally, collection of solidness management service fee. So, how do I collect that fee? What is the mechanism for collecting that fee? So, the most easiest mechanism is to go for a unit area based system, that means as per with property taxes. Larger the property, higher is the charge.

So, it is simple and relatively easy to collect. And automatically, because higher, larger size facility and larger area, so obviously the charge level pay will be high. So, automatically by generators pay a higher value. So, based on the property size we are determining the chart. Or we can have separate solid waste user charges, not as part of property tax.

That means we can ask, we can add a certain component to the property tax as solid waste management chart, but instead we can have a separate solid waste user charge, where we, based on the door-to-door collection process and based on the service we

provide, we can take user charges monthly or after a, after a, quarterly or something like that.

So, but to do that, we require a separate Tech Administration. That means we have to create a separate mechanism, a separate manpower, separate department to collect, or revenue collection department to do this kind of tax implementation and administration. So, that means, it, we require to create a full new setup. So, sometimes the PPP partner is actually the one who is providing this service.

So, in that case extra charge and no, they neither have no legal power for enforcement. And, so, because they are providing this service they may charge extra as well. So, they are not only doing door-to-door collection but they are also collecting money from the people. So, they also can charge extra for that. And no legal power for enforcement. If somebody does not pay, they have no legal thought to prevent that.

Then in this particular system, people can pay per bag of waste, or they can have a flat and variable rate as well. So, we can determine what sort of charges we can generate. And the final way to collect this kind of service fee is to link the charge with the utility bill. Higher your utility bill for other waste like water, sewage and all, we can charge more money.

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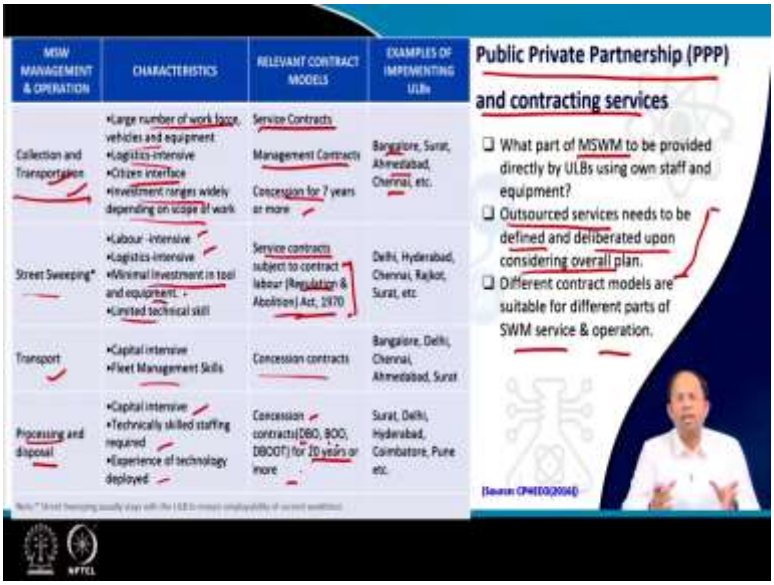

So, now that we have talked about the different ways to generate, to determine cost as well as revenue, the final part that we will discuss is to how to make sure that this kind of Solid Waste Management Services or facilities are provided in a more efficient way. So, that means sometimes what happens, the government, we will talk about public private partnership and the contracting services that are undertaken by the municipal bonds.

ULBs in India, neither they are having lot of manpower or manpower who are specialized, who specializes in Solid Waste Management aspects and all or neither we have proper equipment. So, sometimes, the municipality, the ULB has to determine what part of the municipal Solid Waste Management Services has to be provided directly by their using their own stuff and what part has to be given up for private bodies as in either in direct form of contracts or in form of the other forms of private partnerships.

So, before we do that, the outsource service or the service that we are giving this PPP or this contract, this agency a private agency to conduct, we should really need to define that particular service, that what it is. And we need to deliver it on the overall process on what aspects this private agency needs to do. How it fits into the overall management plan, overall Solid Waste Management plan.

So, this has to be first deliberated upon, and we really need to define the service so that they are bound, the agency who is providing that service is bound to provide at least that kind of service. So, they cannot say that no, that is not being defined, so we will not provide it in future. Different contract models are suitable for different parts of Solid Waste Management Service and operations.

So, that means not similar contracts is good for different kinds of services. So, we have earlier learned about private partnerships of different kinds, like concessions, management contracts, lease agreements, we have learned about those kind of things. So, if you see in this table, it actually lists for different aspects of Solid Waste Management Service, like collection and transportation, usually this involves large number of workforce, vehicles and equipment.

It is logistic intensive because you have to create the plans for routing and always for the vehicles and all. It requires citizen interface. You may have to collect money from the

citizen or you have to wait for them to deliver the garbage. So, there is a citizen interface. Investment ranges, and the investment that is required range is widely depending on the scope of work. So, based on that, we can have different kinds of contract. It could be a service contract, it could be a management contract or it could be a concession for 7 or more years.

And usually we have seen this to be done in different ULBs as listed in the table. Similarly, for street sweeping, it is labor intensive, logistic intensive, almost similar as the collection and all. And, but there is not too much investment in tool and equipment. Unlike over here, there is some tools and some equipment, some vehicles are required. Over here, that investment is not required. So, there is no need for a concession based contract, whereas, and also limited technical skill.

So, it is better to go for simple service contract. As per this Regulation and Abolition, contract labour Regulation and Abolition Act, after following those guidelines, we have to set up the service contract for this particular area. So, here we do not need to go for concessions or management contracts. For transport part, it is capital intensive, fleet management skills are required. So, better to go for concessions contract where it deals only with the transport part.

This is for long haul, that is from the transfer station transporting that waste to the landfill site or to that processing facilities. These transportation is mostly about the local ward level transportation or Zone level transportation. And then finally for processing and disposal. Here, it is capital intensive. You have to set up large-scale infrastructure, technically skilled staffing is required. Experience of earlier use of this similar technologies is required.

So, it is better to go for concessions. And within that we can go for design, build and operate kind of contract or build, own and operate kind of contract or design, build, own operate, transfer those kind of contract. And this could be even for 20 years or more because they will invest money for building a particular infrastructure and they will make money out of it and then they will hand it over to the municipal body.

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So, to summarize, we can say that to determine this, where to provide this kind of contracting services, we need to first understand the commercial feasibility of this particular outsource service that how feasible is to conduct it via this kind of a contract mechanism. Then, duration to recover investment. The agency which will, or the company or the private body which will actually engage, how long they will recover money? Accordingly, we can set the terms of the contract.

Output and performance standards, what we expect from those particular body, agencies to deliver? Social and environmental safeguards, what sort of checks and balances has to be done in terms of the social and the environmental impacts they will create. Technical, operation and financial risk assessment and sharing of those risks. That means any kind of service where it deals with the people, it deals with urban areas, there may be lot of risk involved in terms of financial, if that particular infrastructure fails.

You set up a compost plant, but the compost, the quality of compost is so poor that the entire service should be stopped. So, who will be at that financial risk? So, this sharing of risk has to be between the ULB and the private agency, both. Contract labor compliance with Contract Labour Abolition and Regulation Act, as we discussed earlier.

Land acquisition and community rehabilitation. So, if this is involved that I have to acquire land, I have to rehabilitate some population groups, it is better to be done by the

government or the ULB instead of the private party. So, these are some of the aspects that we can consider while we give a PPP contract or some other form of contract.

So, some precautions and procedures that has to be adopted. We have to have a very clear tender or a contract specifications. That means we have to specify what exactly has to be delivered so that later on they may say that no that is not being specified, we should not do that after they are awarded the tender or that contract. The tendering procedure, how to select the right agency through a proper tendering procedure.

So, for that, we can have both technical and financial bids. Whenever we float a tender for a particular service, then both technical and financial bids would be considered for award of the tender or contract to a particular agency. There could be performance based incentives. If they perform better, then they will be given some intensity that could be part of the contract itself. So, that actually gives motivation for this agency to do provide a better service.

There has to be backup. In case of large cities with more than 1 lakh people, for particularly for collection and transportation of waste, these are emergency, these are basic services, these are emergency services. So, at least there has to be 2 contractors so in case one fails, the other can take over. Timely payments for contracted services. So, this is important because again, sometimes private agencies do not pay their stuff in a timely manner. Similarly, government agencies also pay the money in a timely manner to the private agencies and they will pay timely manner to their staff or laborers.

Monitoring mechanism and penal provisions. In case they do not deliver or do the service that they have agreed to, then there has to be penal provisions. And record keeping, that is, the supervisor or the staff has to keep daily records so that we can check the data and we can take certain decisions. So, these are some of the aspects that needs to be considered when we avoid this kind of contracts.

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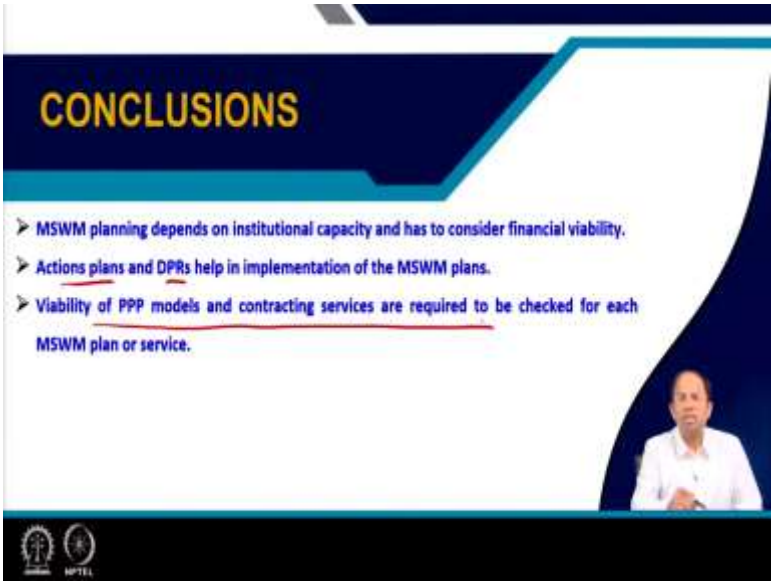

So, these are some of the references that you can look at. So, MSWM planning depends on institutional capacity and has to consider the financial viability. And action plans and DPRs help in implementation of the MSWM plans. Even though they are part of the plan itself, but they are sometimes given, agency, some agencies are given contracts to do certain aspects of, or provide certain aspects of service. So, they are the ones who will prepare the plans on the DPRs. Viability of PPP models and contracting services are required to be checked for each MSW plan or service. Thank you.