Sustainable and Affordable Sanitation Solutions for Small Towns
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Lecture - 10
MSWM - Status, Policy, governance structure

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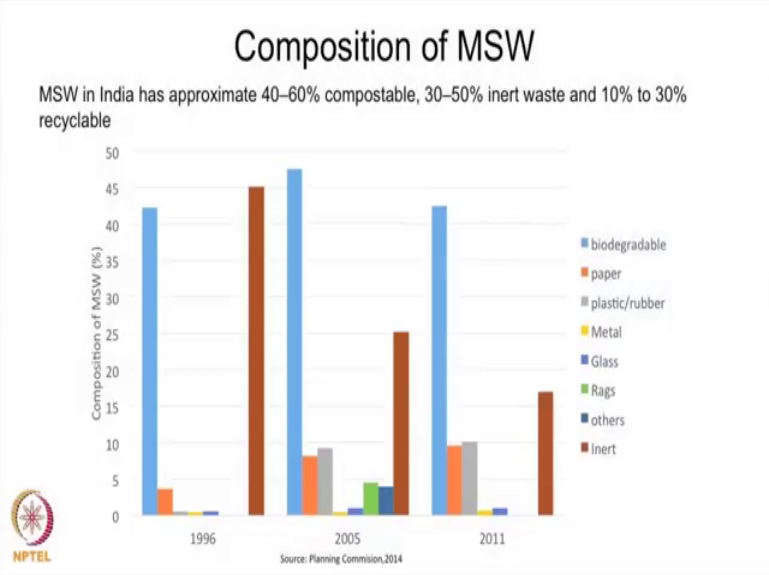

This is composition of Municipal Solid Waste; MSW in India has approximate 40 to 60 percent of compostable waste. India is among those countries, that produces very high organic waste and 30 to 50 percent of inert waste and about 20 to 30 percent recyclable waste so, these are the trends. So, if you see how the paper waste is increasing - actually it is decreasing.

Student: (Refer Time: 00:50).

Yeah, plastic means is increasing you can see here ok, but then what advantage do we have here is that because, of the high organic content in municipal solid waste in Indian cities, we have higher opportunities of composting it and locally composting it in decentralized manner rather then throwing everything to the landfill.

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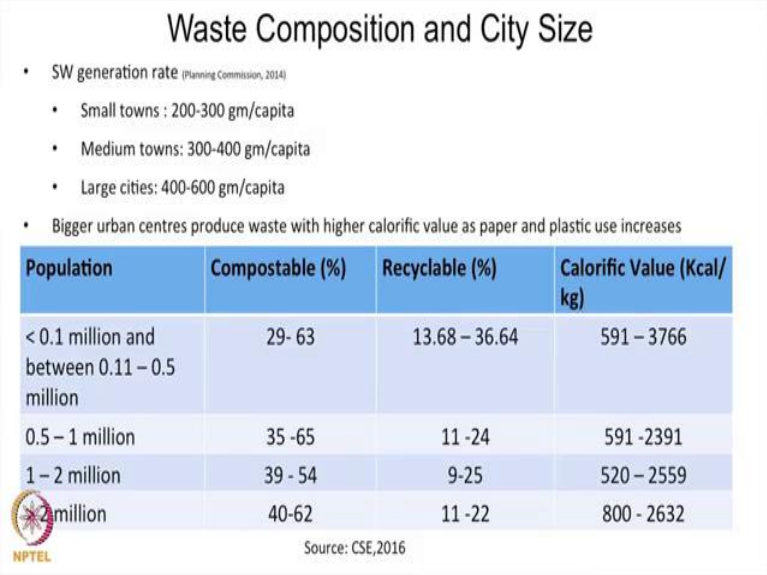

This is waste composition as city size, as all of you said there also before in previous session also, the small towns they might produce lesser solid waste as compared to higher bigger cities and bigger cities they produce high calorific value waste that is, paper and plastic use, do you understand what is calorific value?

Student: (Refer Time: 01:45).

Student: (Refer Time: 01:48).

You can say it is ok.

Student: It is basically the energy that you that the waste releases on the product and then that is measured in kilocalorie. So, if you burn one kilo gram of waste and you have higher kilo calories generated so, that has the higher calorific (Refer Time: 02:05).

So, bigger urban centres like Mumbai or Bangalore, they are producing higher paper and plastic waste it is the trend that we can see and compostable also you can see that compostable material is also being generated highly by bigger cities.

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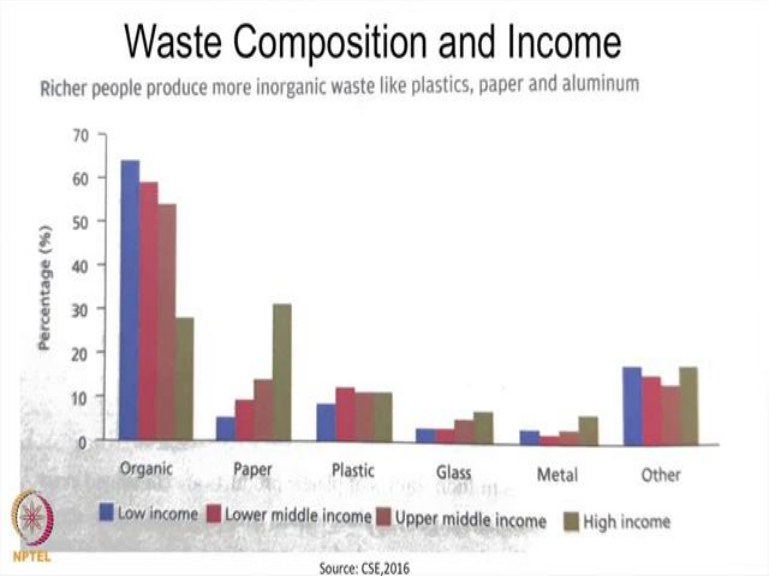

This is the waste composition and income that you guys just discussed. Do you see any similarities here? So, blue one is low income, this is lower middle, this is upper middle and this is high income.

So, low income is producing high organic, paper is higher for high income households, plastic is more or less similar may be lower for low income, glass is higher for high income, metal oagain is high for high income and then there is other kind of material. That is who manages what in municipal solid waste management. As I discussed before also that this is the solid waste management as a sector, it is a state subject according to constitution of India, it comes under state list ok.

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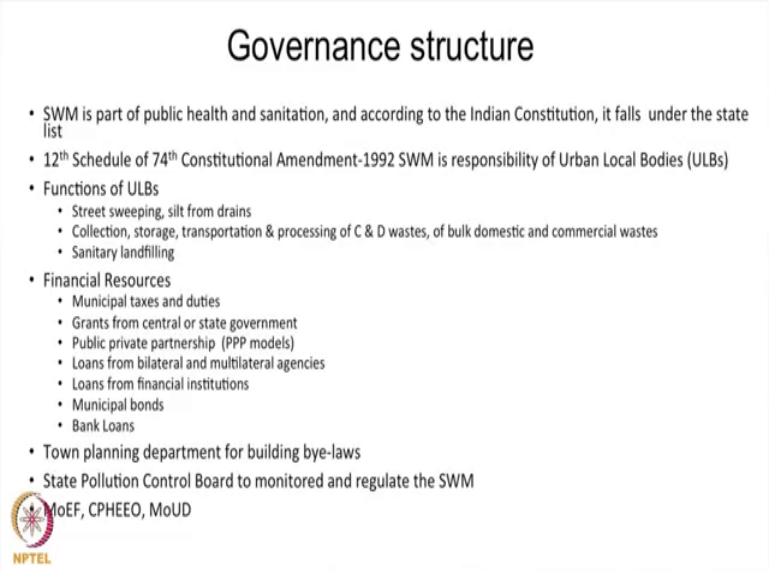

It comes under it is a part of public health and sanitation and urban local bodies are nodal agencies to manage the solid waste management at the city level. Whereas for managing liquid waste management liquid waste or waste water, generally we have state boards. The reason behind it why the liquid waste is being managed by a state boards and why solid waste is being managed by urban local bodies because, there is a general perception that urban local bodies, they do not have capacity to conduct engineering kind of exercises or engineering kind of projects.

So, when they have to construct sewerage projects which are laying of sewers and constructing sewerage treatment plans that is the notion wider scale notion that ULBs be do not have the capacity resources, financial resources, human resources to conduct engineering projects. So, they are just suitable to have elementary garbage removal and garbage management skills, they are just suitable to do that ok.

So, these are the functions of ULB as I mentioned again the same thing, they are responsible for street sweeping, silt from drains, collection storage, they are also responsible for construction and demolition waste and sanitary landfilling. What are the different financial resources that a particular ULB has? They have various municipal taxes and duties, they receive grants from central government, they receive loans from various bilateral and multi lateral agencies, they receive loans from financial institutions like monetary like international financial institution like IMF.

Now, there is a new after 1990s, Government of India tried to experiment with municipal bonds. So, this is another source of income for that and then the bank loans and then when it comes to building bye laws, I hope you understand, what is building bye laws. How do you plan building? So, that that comes under building bye laws that is a part of town planning department which is under the urban local body ok.

These building bye laws also state how to manage waste, how to manage solid waste, liquid waste, what should be the specification of septic tank, which is used to manage household level toilet waste and how to manage solid waste at the building level. This also comes under ULB and then we have state pollution control boards to monitor and regulate different kind of waste and then we have nodal agencies at the ministry level which is ministry of environment and forest which is now ministry of environment forest

and climate change, ministry of urban development and this is technical institution called…

Student: (Refer Time: 06:13).

CPHEEO, which is?

Student: Central Public Health and Environmental Engineering Organisation

Yeah so, this particular organization is a technical custodian of knowledge in engineering and public health and water and sewage, they produces lot of manuals. So, most of the information that you see today in my presentation is actually from their latest manual which was released in 2016. After 16 years of having old manual, they recently came up with the new manual. Role of informal sector, some of you mentioned that there is a role of you know waste picker, rag pickers. So, this is the role that informal sector place into this entire chain of solid waste management, they are very important when it comes to segregation.

Student: Segregation.

Although, we tell we see that they are informal, but they are very organized informal sector, you cannot say that they are not organized ok.

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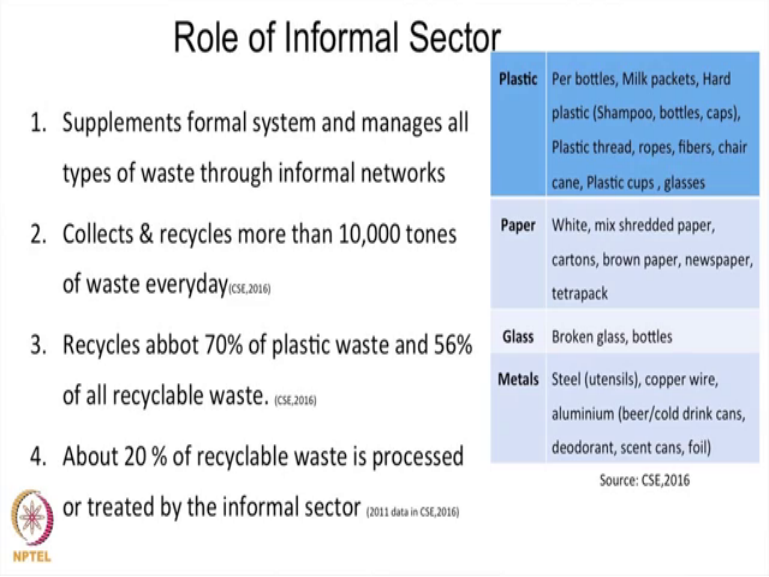

And they collect about and recycle about 10,000 tonnes of the waste in most of the cities every day, they recycle about 70 percent of the plastic waste and 56 percent of all recyclable waste in Indian cities and these are the kind of waste that they deal with, plastics paper glass metals. So, they will be looking out for all these things either directly from your household waste or from the landfills, sometime they pick waste from the landfills also.

So, these are the contributions by the informal sector, it employs huge number of people like recently I was in a workshop in Trivandrum and there were Nepal participant they so, they mentioned about one example. I am pretty sure those examples you can find in India also that they used to have a one landfill in one city and government decided to shut that landfill and start new landfill in other part of the city.

So, around that new landfill, now there are 75 families that are dependent, that are drawing livelihoods from that landfill, 75 families as in people who are into this informal waste recycling and material recovery. So, that kind of employment they have the ability to generate.

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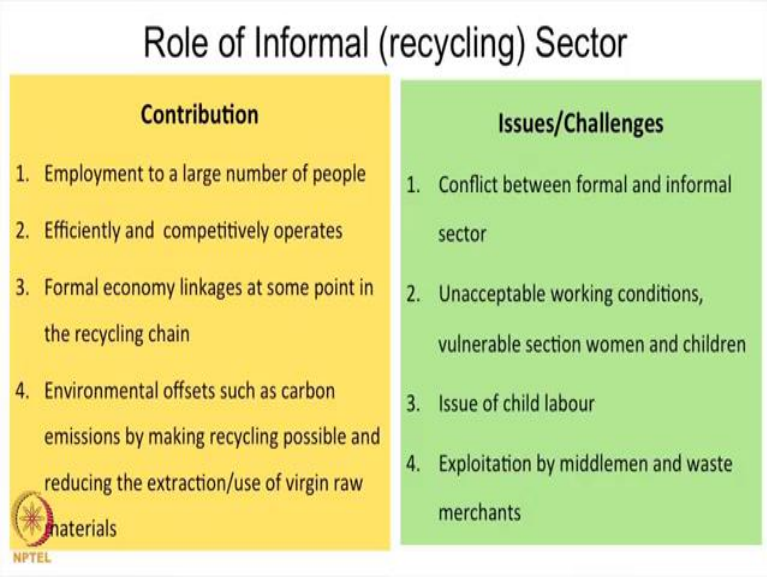

They work very efficiently and operate very competitively; they have formal economical linkages as at some point of the recycling chain. and the kind of environmental offsets because when they recover waste; that means, they ensures that again that waste does not go into the environmental chain. What are the issues and challenges?

There will be always issues formal and informal sector, government will always see that as something which you do not have you do not need to have at the city level. And they working unacceptable working condition, most vulnerable section is women and children, there is a issue of child labor which is involved and there is a exploitation by middle or waste merchants.

Some of you also mentioned in your presentation that like in I think I remember in there in their presentation, the segregation is not happening at household level, this segregation is happening in the end which is the centralized example of wastewater management, centralized example of solid waste management. So, we have two type of systems adopted across cities in different parts of India.

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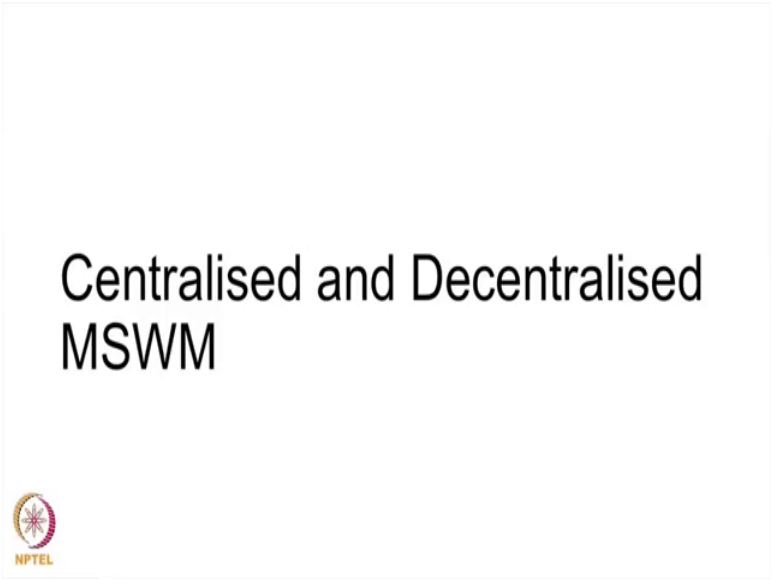

One is centralized system another one is decentralized system; decentralized system means that you try to recover as much as you can during the entire value chain of solid waste. At the segregation, at the segregation part, at the collection, transportation and at the landfills part, but conventionally most of the cities in India are involved in centralized systems.

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Centralized systems are preferred wherever there is economies of scales is favored ,in terms of digger system like sanitary landfills, incineration plants because these are very big to manage and very expensive. So, they are managed at centralized level.

While, the decentralized system or community system are, composting is one example of having decentralized system and it reduces the burden of handling large volumes at centralized location, it reduces the cost of transportation and immediate storage. So, these are the key differences between centralized and decentralized, here I tried to make a merit and challenges for centralized and decentralized system ok. What are the challenges in decentralized system? The major challenge in decentralized system is monitoring.

So, when you have a centralized system because government has limited resources and limited human power, the centralized systems are easy to manage; it is at one location and one person can be appointed and the person can go and just check the centralized system. When it comes to decentralized system, you did not you need more human resources, you need more skills to manage that system.

So, that is one of the challenges in decentralized system and also I have seen and it has been recorded many a times, the decentralized systems like if you have to establish a composting unit at a neighborhood level, there will be some opposition by the people living around and they will oppose, they might oppose about either we do not want to establish or decentralize the aerobic unit or composting unit near our area.

So, there will be some issues conflicts in acquiring land for that. Other advantage of decentralized unit is that material recovery can happen at each point of the value chain which we discussed.

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So, yeah so, these are the different advantages and challenges of centralized and decentralized systems.

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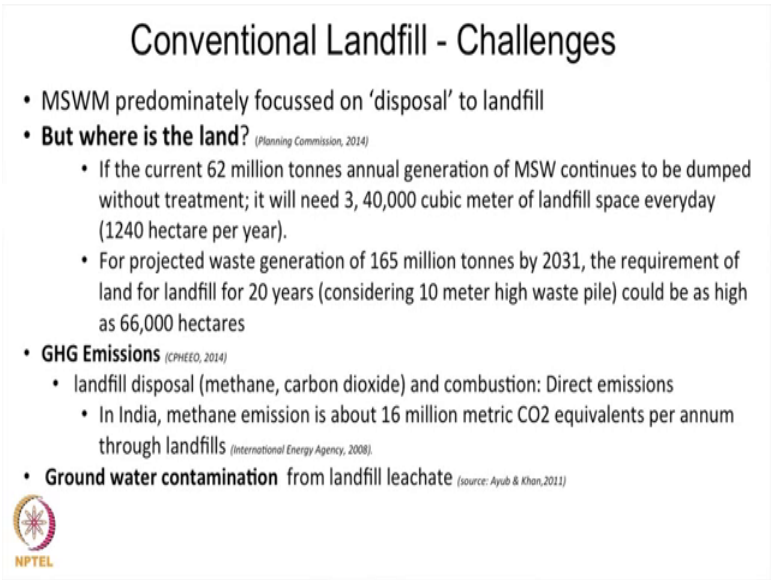

So, conventional landfills that we have right now in various cities are centralized example of managing municipal say municipal solid waste. As you can see that

municipal solid waste was managed conventionally through the centralized system and the focus was on disposal, collect everything and dispose to landfill. But where is the land? If you see these trends, India would be needing so much of land by the end of 2031, we do not have that much land, specifically in context of Alleppey if you see, Alleppey has this particular area, Alappuzha has only 0.6 percent of vacant land.

So, if this city has to adopt centralized system in the landfill, where you going to establish landfills system. So, landfill systems might not be appropriate for everything. So, one has to plan according to the context and also there are there is a possibility of GHG emissions. Landfill disposal ultimately leads to methane and carbon dioxide emissions. So, this is the amount of 16 metric million metric carbon dioxide of methane emission is released though landfills in India. So, landfills are huge contributors to GHG emissions which is responsible for climate change.

And; obviously, there are ground water contaminations from the landfill leachates. So, when the biodegradable mass or the mass that is decomposes, there will be some leachates that will that might go into the ground water.

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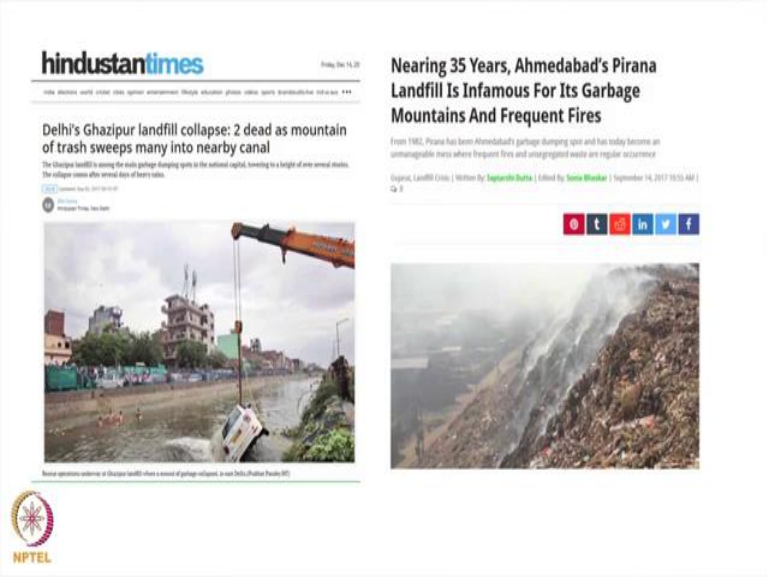

These are the recent cases that are happened around landfills, this is the very famous case in Delhi that happened I think 2017 that entire landfill, Ghazipur landfill it collapsed, there was a huge heap of waste and that collapsed and that killed about two people.

And this is again somewhere in Ahmedabad, which the heaps of garbage is constantly catching fire. So, landfill sights are bio-hazards in as in a they are hazards actually for the city yeah. So, we come to exercise 4. So, what you have to do if you understood centralized and decentralized system, you have to tell me that if your city has centralized system or decentralized system and if you can and if you are able to identify different components of centralized and decentralized systems ok.

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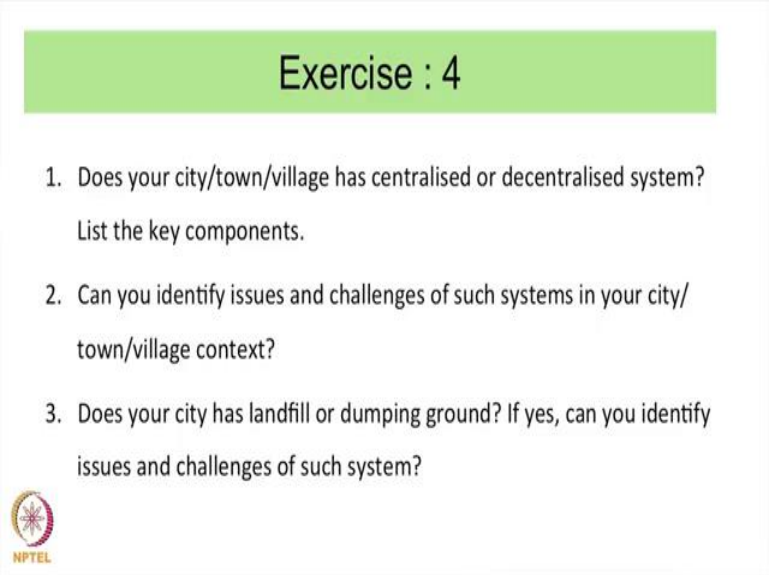

And second thing you have to identify, if there are any challenges you can identify like if you if your city has a landfill, what are the challenges. If your city has a collection system, what are the challenges and does your city has a landfill or dumping ground and if it if you can identify certain issues and challenges associated with, be it environmental issues, be it related to social issues, informal sector, livelihood issues, ground water issues. So, all those issues you have to identify.