**Integrated Waste Management for a Smart City**
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**Module-04 Lecture-17**
**Swachh Bharat Mission and Smart Cities Program Overview**

Okay. So let us get started with other two programs that we have been talking about. We had in this, the previous module and the module before that, we covered this MSW Management Rules 2016. Now in this particular module, we will try to look at the Swachh Bharat Mission, that program and as well as the Smart Cities and I hope to complete both in this particular module.

We will just give a quick overview and if you are, as you are interested in this particular course, so I am pretty sure you must have being to the website of at least Swachh Bharat Mission. If you have not being there, I would encourage you to go there. There are lot of things, lot of things have been posted. And what I will try to give in this module is just a quick snippet of what are the things going on in terms of the SBM, Swachh Bharat Mission program and as well as the Smart Cities.

Just a quick overview of that and how this smart city, how the waste management fits into smart city. Because when we talk about a smart city without having a very good waste management or rather we can call it a smart waste management system, we cannot have a waste, sorry we cannot have smart cities. So let us get started.

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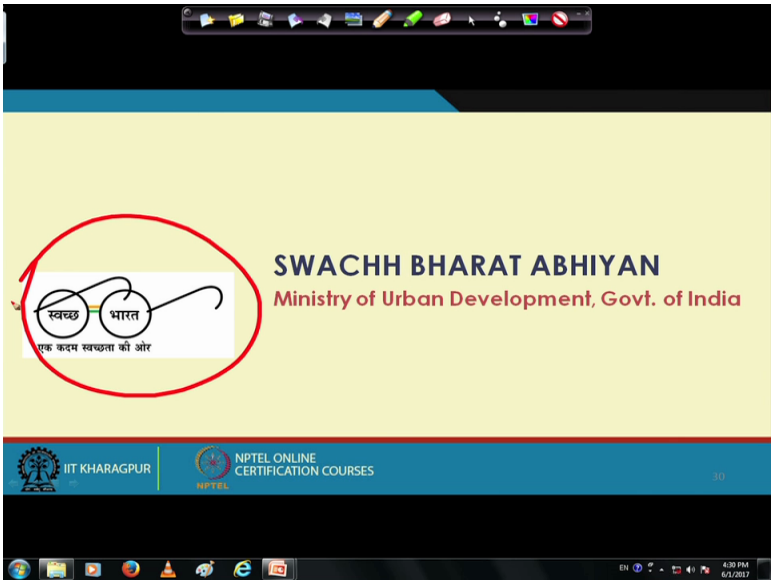


So in terms of the Swachh Bharat Abhiyan which started almost more than two years now on or yeah, 2nd, I think it was 2nd of October 2014. When it started, so it is that you see the logo of Swachh Bharat like Swachh Bharat which is a very famous logo now. You must be familiar with that. And it comes under Ministry of Urban Development. There is, there are say like dedicated office now on Swachh Bharat and there are lot of people working in this particular area.

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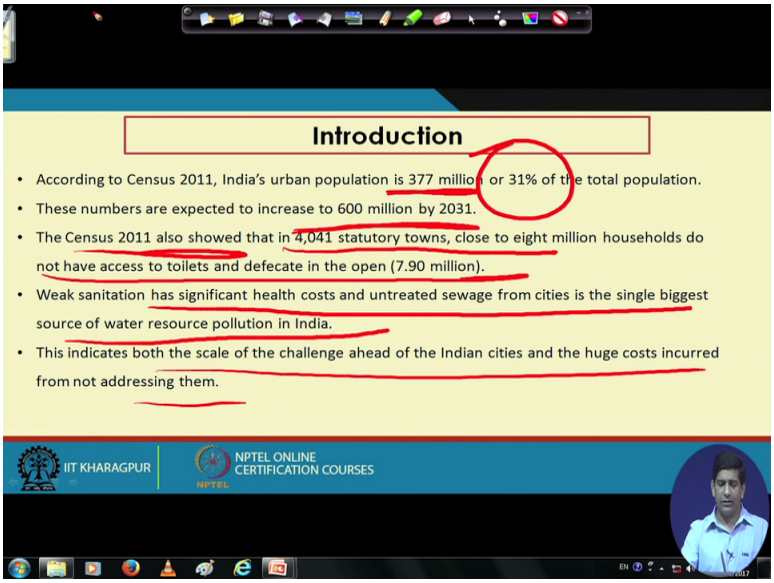


So in terms of the Swachh Bharat, why, what is their like a rationale going behind that? Again India is getting urban, we are getting more and more population. And as per 2011 Census, nearly

31 percent of our total population is in urban area. And this number is going to go up, that is around 377 million. That (())(02:25) to go up to 600 million by 2031. So we have more and more people coming into the urban areas.

And then one of the major focus of at least in the initial phase has been on like trying to prevent the open defecation, that has been like building of the toilets. So as per the Census 2011, we saw that there are 4,041 towns, close to 8 million households, they do not have access to toilets and defecate in the open. That is nearly like 8 million people. 8 million people do not have access to toilet.

So like a close to 8 million household, sorry 8 million household does not have access to toilet. So it is a weak, that is a significant health cost. And untreated sewage from cities, it is contaminating our water. There has been a recently if just during the summer months while you were probably taking the holidays, there was a news in Hyderabad, a lake, almost 30,000 fish died in that lake. And that was I think in late May, we saw that news coming up.

And that, we do not exactly know what was the cause of the fish death but the thing was that lot of sewage, lot of industrial waste was getting into these water bodies without any treatment and that is, that was having a lot of BOD, Biological Oxygen Demand and that reduces the oxygen content of the water. And as we know if the dissolved oxygen content gets very low, fish starts to die. So we had nearly 30,000 fish dying.

And there could be causes of some industrial affluent there as well. But that is, we need to prevent those kind of death. So we need to have a proper toilet and as well as proper sewage treatment plant. So initial focus of this Swachh Bharat Mission has been on that particular area. And of course, waste management does comes under, Swachh Bharat Mission is also looking at the waste management side.

So there is a lot of challenges is there. Huge cost is there if you do not do it. So if you do not do anything, if you have improper waste management, it is not that we are going to, say if you do not spend on waste management, you will spend on your medical cost. So you will get sick and then you will pay on the health cost. So if you look at from government point of view, not spending money on waste management does not really help because if you, the health budget will go up, people will get sick and they will come into these the hospitals. And we lose lot of

manpower, man hours, is not it? People get sick and they are, even if they are partly, even if they come to job, if they are not really feeling well, the work efficiency goes down. So ultimately, we are losing the man hours there as well.

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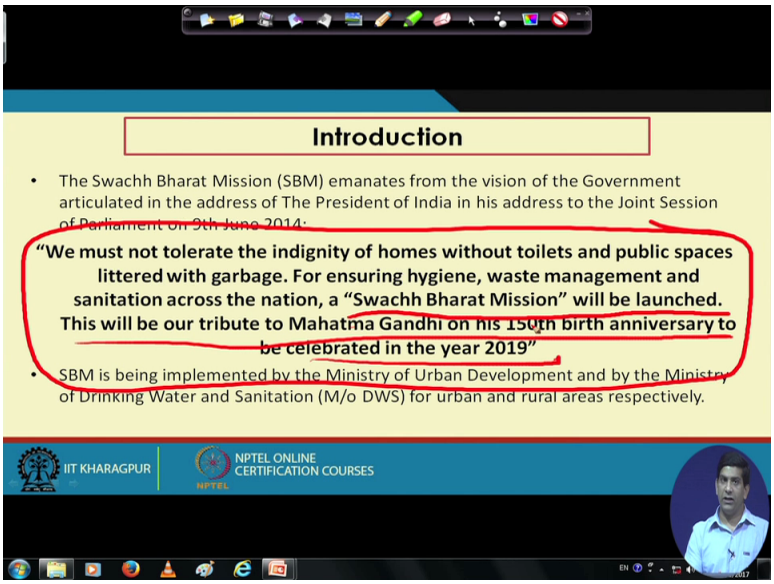


So then that is the kind of the background why the Swachh Bharat Mission came and in the joint session of parliament on 9th June, 2014, the President of India, he this the what you see in the middle here, this is essentially a quote from the President of India's joint address to the parliament that we must not tolerate the indignity of homes without toilets and public spaces littered with garbage.

For ensuring hygiene, waste management and sanitation across the nation, a 'Swachh Bharat Mission' will be launched. This will be our tribute to Mahatma Gandhi on his 150th anniversary to be celebrated in the year 2019. So this government, as soon as it came in, it started working on the Swachh Bharat Mission. There has been, since it is so what, it is almost if you look at from the announcement in the parliament on 9th of June, 2014, here we are looking at almost three years like more than three years ago where this has been announced.

This has, there always be say any program you start, there will be challenges in implementation, so as with Swachh Bharat Mission or even for the Ganga Action Cleanup Plan. But things, at least things are (move) are being talked about and people are trying to do something to solve this problem. That is a good start. What we need is a thorough critical analysis of the problem, first to

understand the magnitude of the problem and also try to come up with a realistic workable solution.

We do not want a fancy, for example, even for this sewage treatment plant, I would rather go for a treatment plant which is workable, which will work in our Indian context. We have to keep in mind that we do not have a super-skilled manpower to run those plants and we will not have super-skilled manpower overnight. So it even to build that skilled manpower also needs time.

So still even if we start with a simple workable waste water treatment plant which works say at 90 percent efficiency or 80 percent efficiency of that so called state-of-the-art fancy system, I would rather go with that because at least 70 to 80 percent of the contamination will be removed. 70 to 80 percent of the BOD demand and other things will be removed and then I have to deal with much less.

And as we master this particular plant, as we get comfortable running this particular plant, we can always add sophistication to it. That is how most of the world did it. We can, these things cannot be done overnight. Many times when I make this kind of presentations in a conference, I get an argument that like but we have, we are, look at the cellphone. In the cellphone, we are one of the great in the world.

Yes, our cellphone prices are cheap. With now this Geo and other stuff, it is even lot of competition going on between all these different service provider. And we, this is one of the cheapest cellphone prices in the world but cellphone technology is not the waste management technology. Those two are totally different ballgame. It is unfair to compare the two because in cellphone technology the knowledge curve, that learning curve is, it is only needed to select people like those industry which is involved there. And then the products come, we are using it as a product.

And the waste management, we have to get the learning curve of the entire population to up to speed. They have to understand the importance of source segregation. They have to understand the importance of not doing the open defecation. So that is totally different ballgame, it is unfair to compare. And it is, I would kind of sometimes like really amused when people compare, make those kind of comparison because it is cannot be compared.

If you understand the two systems, you will never compare them. So again, coming back to this idea that Swachh Bharat Mission started and it is lot of things are happening around it, lot of toilets were built. We have to be again, make sure that the toilets that are built is kept or people keep on using it. That is a big challenge. In the past, we have got the toilets made. The people were, people after few years, maybe few months and these are the toilets were built, the people were, they never took the ownership of that. So those we, there is lot of education needs to go on.

And lot of things are happening which we, this is a work in progress, you have to keep on working on it day in and day out. So SBM is being implemented by Ministry of Urban Development and Ministry of Drinking Water and Sanitation. So those are the involved for urban and rural areas. So for urban area, it is Ministry of Urban Development. For rural area, it is Drinking Water and Sanitation which is responsible for this.

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And then what is, there is a Swachh Bharat Urban Portal. You can go to Swachh Bharat Urban, there was a Swachh Survekshan Award. If you have followed the news, you must have heard about that. I think Indore got the first prize which was, which just happened couple of months back. Indore got the first prize, then the Bhopal and I think the Vizag was there as well if I remember correctly. But it is there on the website, so you can go and look at up on the website.

And for the, and for some of these cities, we will try to give you the ground report as well as part this course. We have visited these cities, we have collected some information and we will share

some information with you that how these cities are doing, what they are doing in terms of the waste management. And as I was mentioning to you in the previous video, the Swachh Survekshan is based on the survey done by the local, survey done using the local population.

So it is, if there is a impact, say for example, Indore which got the first prize, it is may not be the best waste management system in the country. But the improvement of the waste management in Indore over the last year or so has been much more than as compared in general with other city. So that is the reason why it got the award for the best city in this year. So we need to understand what was the mandate for this particular award.

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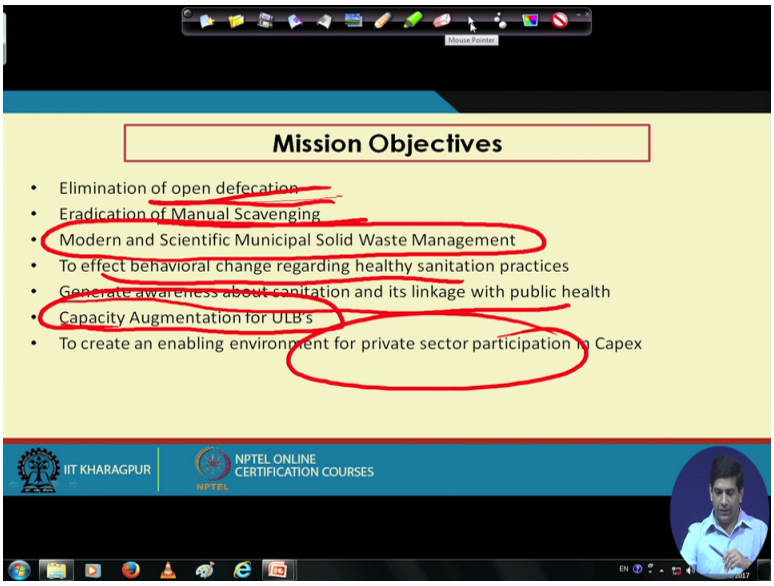


So then mission objective, elimination as we talked about, elimination of open defecation, that is the number one like at least from the initial point of view. We are looking at the open defecation. Manual scavenging, that is another thing. Modern and sanitary municipal solid waste management, so that is where from this particular course, modern and scientific municipal solid waste management. And that is, that was actually after looking at the Swachh Bharat Mission. That was the motivation for me to offer this course online so that although I have been teaching this course at IIT Kharagpur but I wanted to do it online, so it reaches to a wider audience and so that we can talk about this modern and scientific municipal solid waste management basics so that we can have the Swachh Bharat Mission a success.

And to effect behavior change, that is again big thing. Then create awareness, sanitation, public health, capacity augmentation of ULBs. Not only (capac), when we talk about capacity building, it is not the physical capacity, it is also the mental capacity, intellectual capacity and that is also needed. Many times our workers who are working in the waste management, they do not really understand the complexity or the technical challenges of the waste management field which is their, it is not their fault, they were never really trained in this area.

So we need to provide, we need to make simple, understandable training material so that this people can get trained in this particular area. And that I am telling you with the, I have visited several ULBs in the Eastern region of India and also in Delhi and other places and based on interacting with the people working on the field, those supply inspectors, those sanitary inspectors or those people who like workers or the labors working at the dump sites or the people who are collecting the door-to-door waste, after talking to them I get an understanding that they are being on, they are trying to do the job as much as, as best as they can.

But they will really benefit from having a good quality training material from time to time in terms of their intellectual capability of helding this. Everybody and then they will feel important too. See if, you need to, to make something, to really get people working for something, you need to show them how their role is important, how their role is going to serve like the big purpose.

So recently I was reading somewhere where John F. Kennedy was telling a story that he visited NASA center one time and there was a janitor who was, janitor is essentially the safai people, that is a safai karamchari, he was doing that, he was just mopping the floor and when the person asked him, what are you doing? He said I am helping in sending a person to moon. So even the safai karamchari of NASA was that much motivated enough that he is working towards a much bigger cause.

So that knowledge, because he was aware of the things happening around him, what is the importance of that NASA center. Similarly we need to make these workers really understand that this is a very, very important thing to have this country litter free, make this country clean. And it is not the clean part, it will really help our productivity, it will make people healthy. We will not have to go, we will not have to take much that much of a medicine, people will not get sick. Our,

so with those, the big picture people have to understand and once people understand, then they get interested in the work like why they should do it. Once they know the why part, then they will of course do the other things associated with that.

And have a private sector participation. That is also very, very important because the government cannot do all the things by themselves, we need to get the private party working in this area, that is public-private partnership needs to come in.

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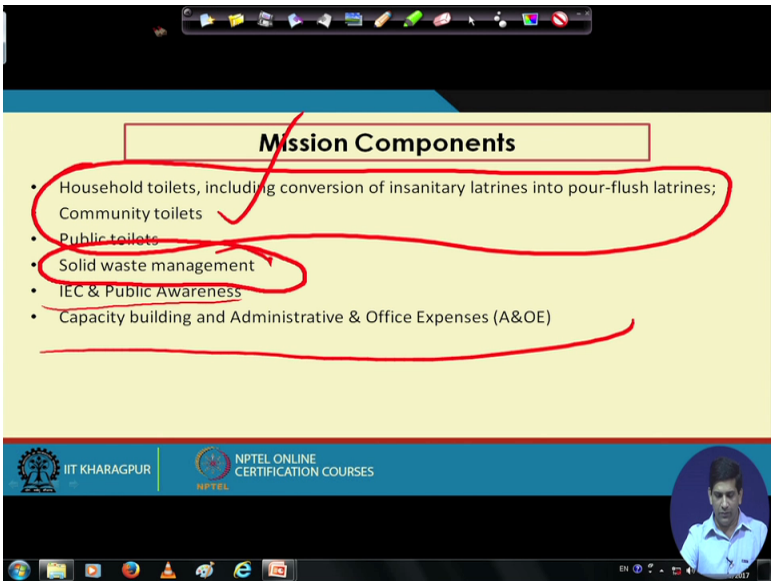


So then Mission components, there are the household toilets, that is one of the major focus area. Household toilets, community toilets, public toilets, those things are being done. This is, you must have heard too much things about that. There is lot of targets on that. Then, what I am more interested, of course, I am interested in this sector as well.

But based on my expertise, what my, what I think where I think I can contribute, where we can contribute, those who are working in the waste management area is solid waste management part of the Swachh Bharat Mission. And that is we need to make all these, it waste management done in engineered, scientific and technical savvy manner. And that is where, that is the reason why this course is being offered. And then do the public awareness, capacity building and those things needs to be done as well.

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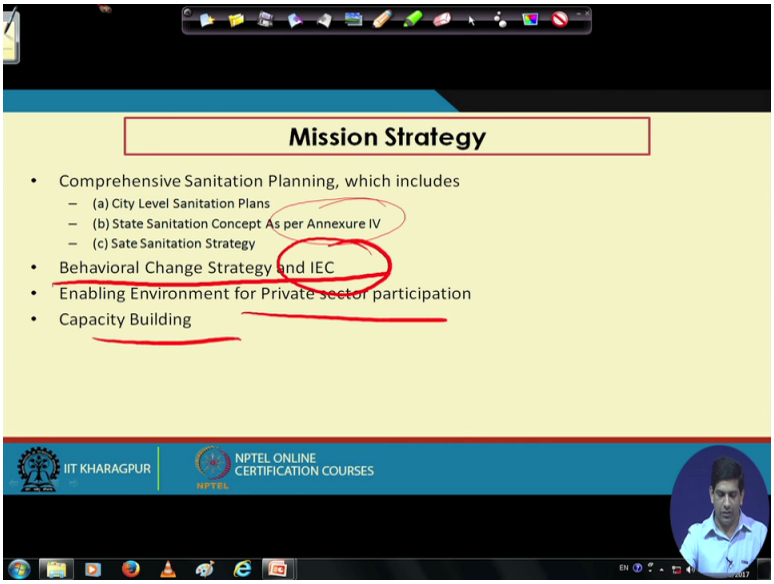


So in terms of the strategy, there are comprehensive sanitation planning is there. In terms of city level plan, state level plan, state sanitation strategy, those things are there. And those there in, as part of those again we have, we do have like different bodies coming in and doing stuff for different aspect. So there are city level sanitation plan, the sanitation concept as per there is a, you can go to that document and look at the Annexure IV, State Sanitation Survey.

Again one thing I would like to mention here that for the Swachh Bharat Mission as well as for the Smart City, there is a comprehensive, sorry, that is not, there is a kind of a manual, the government overview manual which is there which will be posted along with the material for this particular week. So you will have that. Although it is available, you can, it is on public domain. You go through Google and say Swachh Bharat Mission plan or the Smart City plan and you will get that document. But for even some of you may not want to even do that. So I, and especially for today's students you need to kind of give them material much more than, so I am planning, I have already downloaded them and actually I use them to prepare these slides.

So I will give you those material, so you can read that as well and where you will see all these Annexure IV and other things as part of that particular document. So that is, then behavior, behavioral strategy, that information and communication, education, getting the private sector, capacity building, all those things are part of this mission.

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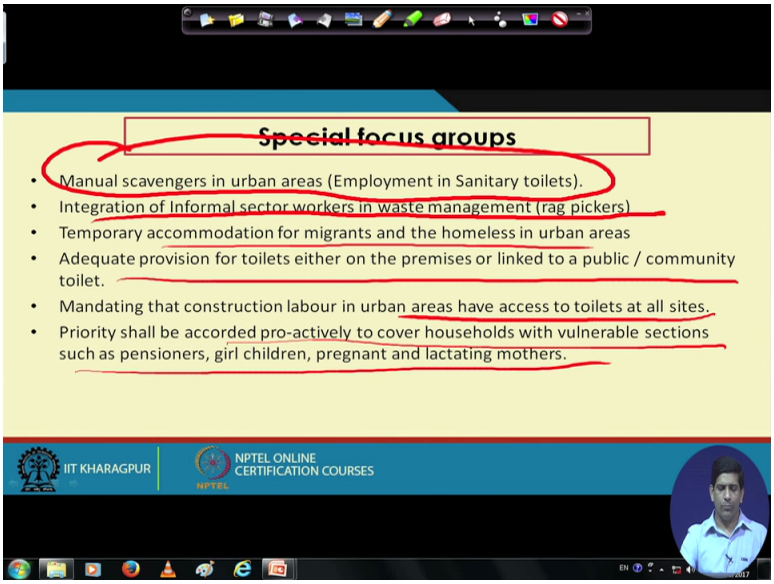


Then there are special focus group where there have been some focus group in terms of for manual scavengers, that is for urban areas. That is employment in sanitary toilets. So that is where the focus over there. Then getting this informal sector into the waste management; so rag-pickers, getting them in formal sector. And temporary accommodation for migrants and homeless, and then provision for toilets with the public area, public toilet.

Construction labor to have access to toilets. To cover the, proactively cover household with vulnerable sections such as pensioners, girl children, pregnant, lactating mothers. So there is some target group as it happens with any program, this they want to make sure that this people especially those disadvantaged people get little bit of like they are looked after.

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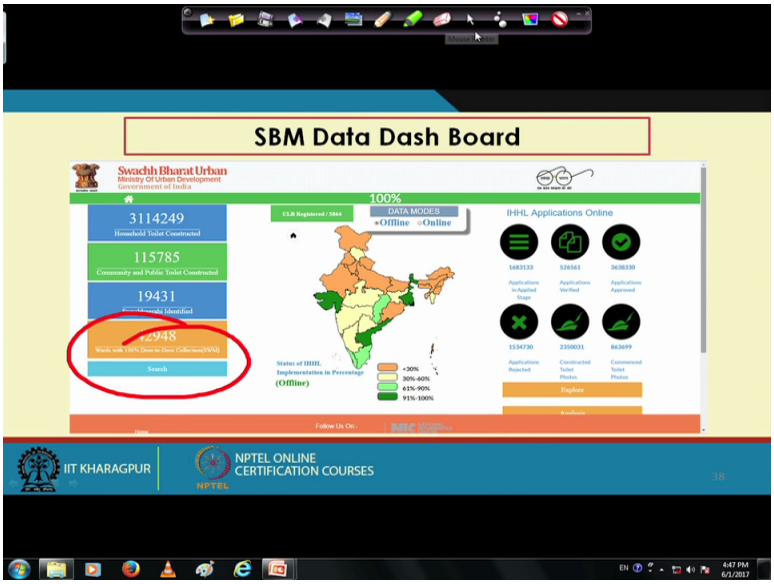


And then there is a, you can go on with a website on the Swachh Bharat Urban website. You see the SBM data dashboard where you can look at online and as well as offline where you see how many applications were stored, how many applications have been verified and how many applications have been rejected, how much toilets have been constructed and then this how much toilets are still is being used.

Then there are Swachhgrahi community and public toilet, household toilet construction, awards with 100 percent door-to-door collection for the Swachh Bharat Mission. So there are these number of awards where we have the door-to-door collection happening. And this is, every time this is a dynamic number. So this data has been taken couple of months back when I was preparing the slide. So this again when you, if you look at today's data on this particular portal, these numbers will change. But this is just to give you some idea about what are the different like how this portal looks like and where you can monitor all these different numbers on Swachh Bharat Mission.

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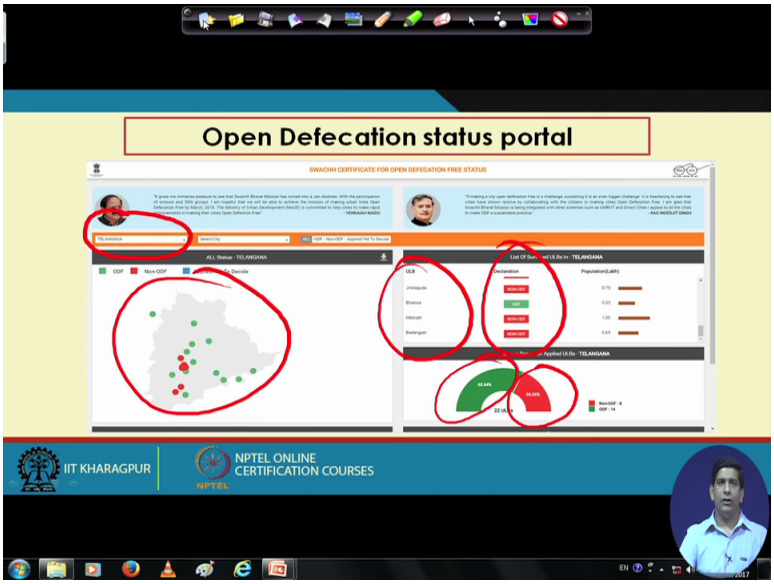


Then there is open defecation status portal where Swachh certificate for open defecation free status. If there are certain, ODF is open defecation free, those green dots, so the green dots are the open defecation free. And the red ones are the non-open defecation free. So that is, and these are, there are those are, so here the you can choose different states. Here the Telangana state has been chosen. You can choose a city, you can look at what is their status.

So as you see in the just here, we see lot of green dots and some red dots and there are lot of other areas where we do not see, we do not have data for that yet. Then here like list of surveyed ULBs. In terms of the ULBs what are the, so here certain ULBs, whether they are open defecation free or not, open defecation free. So in terms of the 22 ULBs right now, nearly 64 percent is open defecation free but 36, 37 percent, 63 percent sorry and 36, 37 percent is non-open defecation free. So that is the kind of in terms of different states.

So these data are available. Again, we need to be careful in terms of proper data quality. Again I hope that the data which has been reported because the central government will rely on the data coming from the state government. State government will rely on the data coming from the ULBs. So at the ULB level, if we do not provide correct data, sometimes what happens is you do not want to, we have a tendency, that is a typical human tendency, we do not, we try to hide things which is not correct.

So especially say if somebody has TB in your house, you do not try to tell that thing to anybody in your neighborhood. Because that is, unfortunately that is the way we are. So although, so that is the same thing over here. If my city is, although it is in the border line, it is maybe 70, 80 percent open (defeca), still 20 percent of the people go for open defecation. I, people are tempted to report it wrong, so which should not happen because that actually, you are not helping the cause. If you report wrong, you are not helping the cause. You are actually making it difficult for implementation.

So if, as long as we are honest, because this is, it is all of us responsibility. Each and every citizen of the country is responsible here to make it a success. So it is we have to work together as a team on that. But at the same time, if we report wrong data and that is if we have any wrong data, the whole thing kind of gets compromised. Because that is we need to make sure the data coming out is correct and to and is factual.

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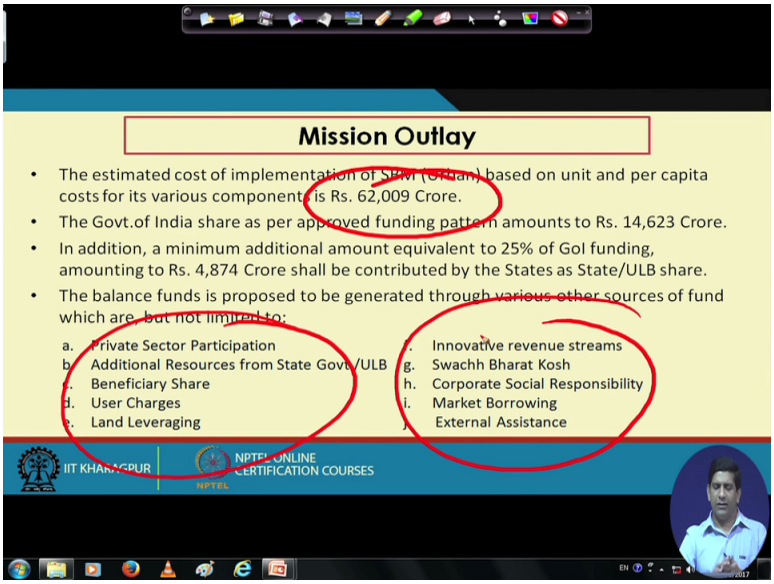


Then there are, mission has, there are lot of money has been allotted as well. So it is, there is a lot of (16,000) 62,000 crores estimated cost of implementation and the government, so we will not spend too much time about. So government, Government of India will give some money, then the state will give some money, ULB will get, ULB will also provide some money.

And then there has to be some private sector additional sources, CSR money, land leveraging. Swachh Bharat Kosh, we all are paying for that. Corporate social responsibility, market

assistance, so those are ways how the money is coming from. But that is may not be, it is not that technical part. It is, of course it is an important part. I am not, but it is we will not, does not worry too much about that.

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Then, corporate CSR, Swachhata Augmentation, such projects. CSR, this is also coming in. We can, CSR money, Corporate Social Responsibility, that is helping in terms of Swachh Bharat Mission as well.

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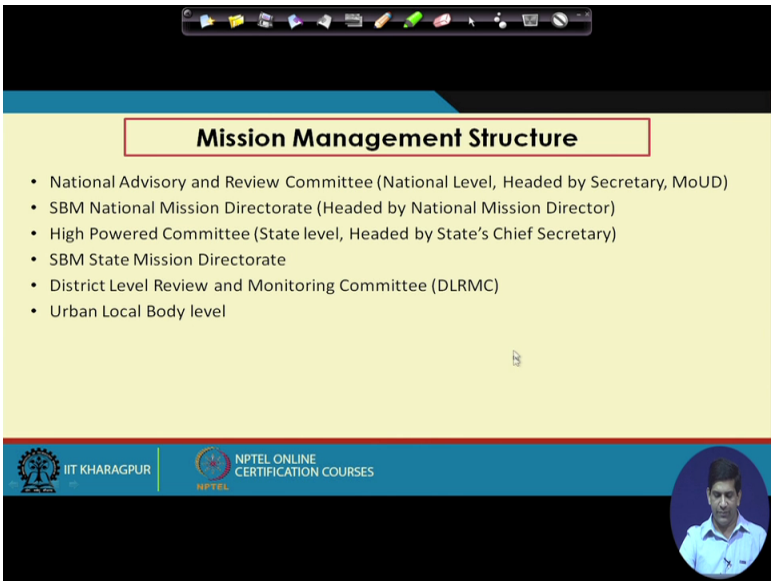

Then mission management, there is a national advisory and review committee headed by Secretary, MoUD. Then SBM national mission directorate is there. High Powered Committee is there at state level. Then State Mission, district level review, urban local body level. On each level, there is a management structure for that.

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Swachh Survekshan, we already talked about that.

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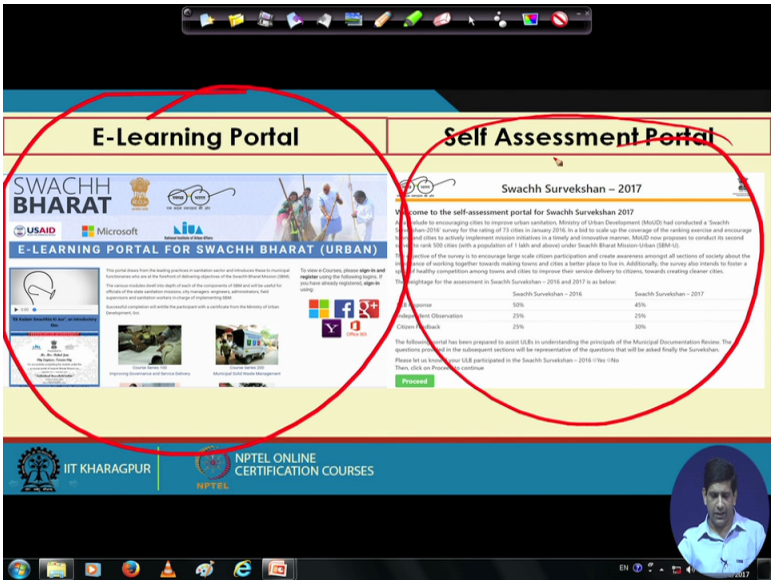

And then there is e-learning portal, so where you can, there is e-learning portal for Swachh Bharat Urban. So you can go there and there is lot of information is there. And I hope, so this there is a lot of information at this e-learning portal which you can use to get more knowledge about how are the things are happening in terms of the Swachh Bharat. And then as part of the Swachh Survekshan, this form was there which has been used for like a response from the ULBs. So that is kind of gives you a quick overview of Swachh Bharat Mission.

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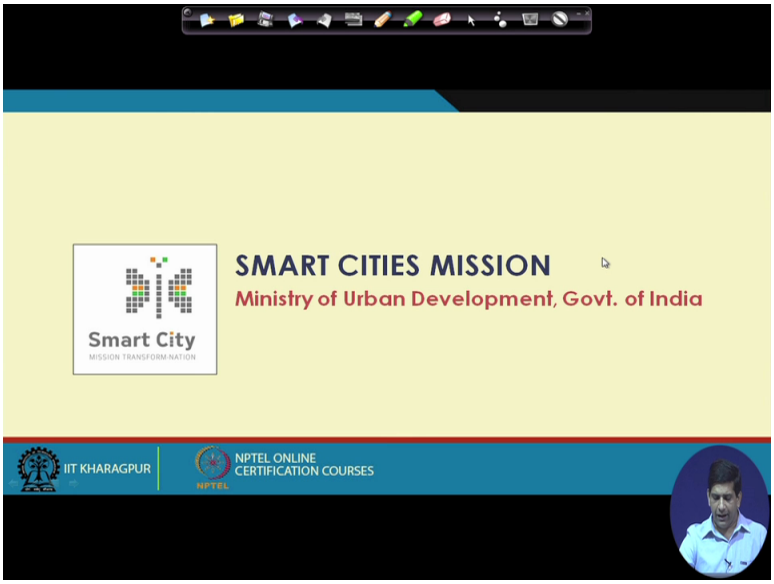


The next part, we as I said, we will try to cover about the Smart City Mission. The Smart Cities again it is comes under urban development.

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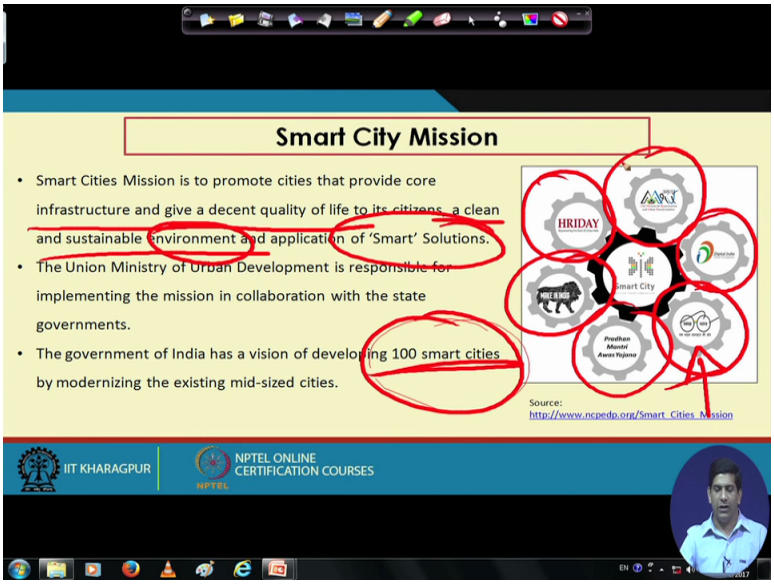


And so when we talk about a smart city, there has, there are six different, there are lot of programs which is coming under Smart Cities. And the smart, government has a vision to develop 100 smart cities. And so why we are talking about a smart city in this particular course? But because you cannot have a smart city without a smart waste management system.

And as the title of the course is development of integrated waste management for a smart city, so as we are going to develop these 100 smart city, we need to develop integrated waste management system for these 100 smart cities at least to start with. Of course, we have to do it for other cities as well. So what is the smart city? It is basically to promote core infrastructure and that does include waste management, decent quality of life, clean and sustainable environment.

So when we talk about clean environment, again waste management. Application of smart solutions, usually when we talk about a smart, we start thinking about cellphone, ICT and all those electronic gadgets. They are needed but what is the point of having electronic gadgets if you do not have clean water, if your street is totally dirty. And that is what I many times, sometimes I talk about in terms of that in our, say many railway stations these days are having free Wi-Fi.

But many of those railway stations which have free Wi-Fi, unfortunately does not have clean drinking water. So we have to buy water like Bisleri, Kinley whatever, different brands. And we

cannot go to the tap and take it and drink that clean water. So in my view, I think the clean water is more important than having the free Wi-Fi. But again, that is a different topic, we will not go there.

So similarly here to make something a smart city even everything is all electronic connected, very nice but if my city is dirty, the waste is not collected properly, we have littering, if we have rag-pickers trying to pick things from there, they getting hurt, people are still, that is not really a smart. That will not be a kind of real smart city. So solid waste management has a very important role to play in terms of making a city as a smart city.

So that is the reason and that is the one of the, so we will be focusing on urban area in this course and that is the we are not talking too much about the rural part. And so Ministry of Urban Development is responsible and so here in terms of the smart city, there is a Digital India is there. There is a Swachh Bharat, so there are different components. There are Digital India is there, the Swachh Bharat that is where our waste management will come into picture.

Then, Pradhan Mantri Awas Yojana. Even Make in India, if you talk about some of these waste management technologies, we can, that is kind of comes under Make in India. Then HRIDAY is there, AMRUT is there, so lot of programs are there in terms of, which will help in terms of development of a Smart City program.

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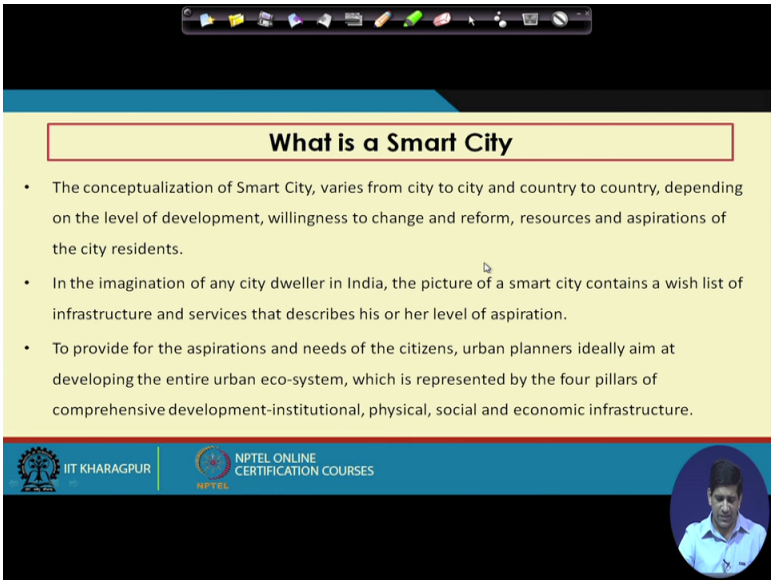

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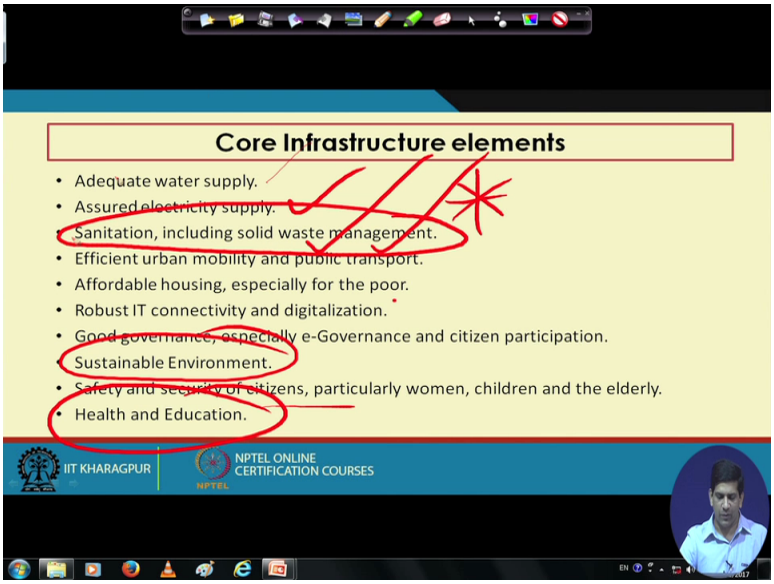


So we talked about the Smart City, it is a concept varies but essentially it is to provide urban ideal developing, entire urban ecosystem which is, which has adequate water supply, where you have adequate water supply, good electricity. Sanitation including solid waste management, that is where I am kind of trying to focus on. Efficient urban mobility, affordable housing, robust IT connectivity, good governance, sustainable environment, safety and security, health and education, so all these things comes into picture. So this waste management is where we will try to contribute as part of this course in this Smart City initiative.

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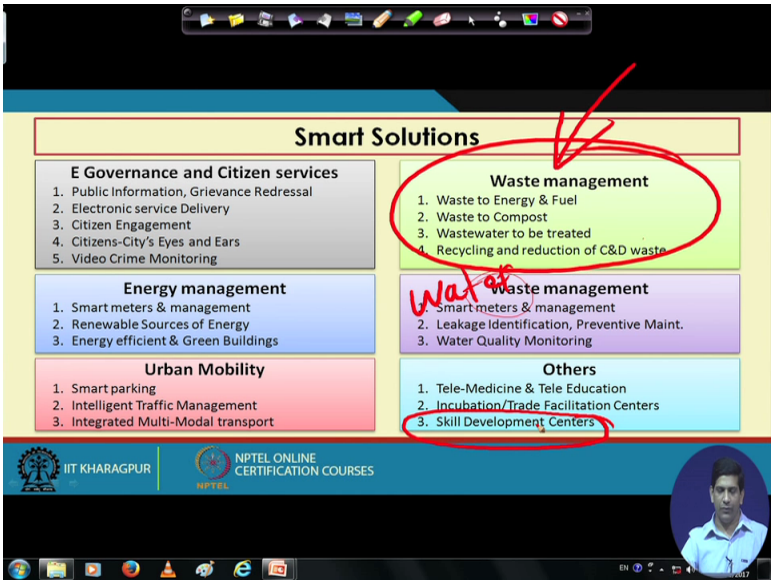


So there are again Smart Solutions: E-governance, energy management, urban mobility. So here we have the waste management and this is actually, this is a typo here, this should be water management. This is not, let us, this is actually a water management not waste management. That is the water management, so smart meters and management, leakage, water quality monitoring. Waste management is right here.

So this waste management is waste-to-energy and fuel, waste-to-compost, waste water, recycling and reduction of C&D waste. So this course is, will focus on this part in, so that is why we are talking about Smart Cities because smart city also requires our help as part of waste management engineers. So we need to help in terms of development of, that is almost like one-sixth. If you look at one, six aspects, so one-sixth of our aspect is on waste management. And then even we are going to put some skill development center, skill development also from the waste management point of view, so that needs to be done.

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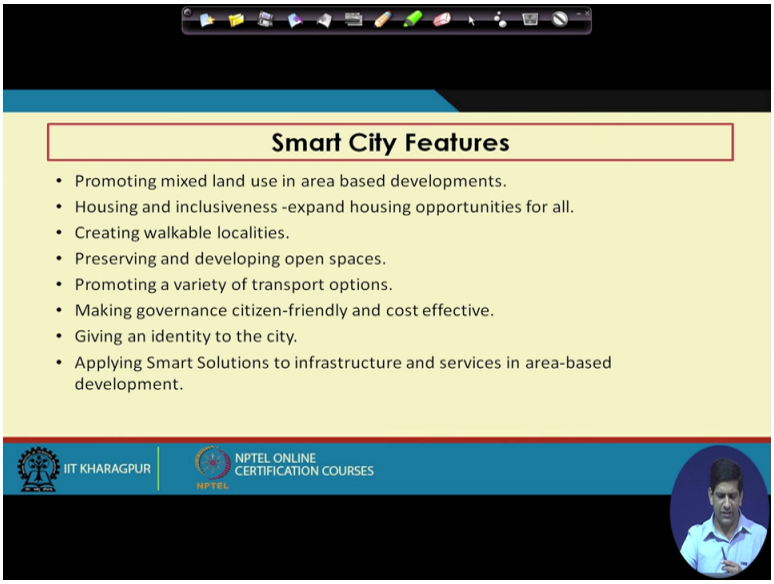


So next, there are certain other things in there. We will go over this really quickly. Promoting mixed land use, housing, creating workable site, so these things you can read. These are not directly related to the waste management part. So I will just focus on the waste management part.

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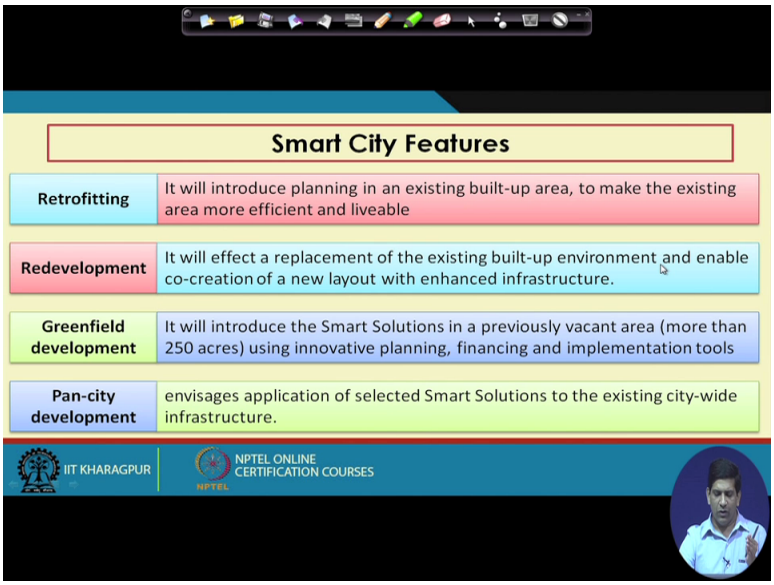


So when we talk about smart city features, we have to plan for the built-up area, make existing area more efficient and liveable. So in terms of coming up with a solution for this smart city, for this waste management perspective, when we talk about the solution from the waste management

side, there is existing infrastructure. There is existing infrastructure and every ULB has an existing infrastructure for waste management.

It may not be a perfect, it is, it may be in a dilapidated shape. There are lot of issues associated with that but there is something there. So rather than, in many cases, we can take those things. Whatever is there, we can start from that rather than starting from scratch. In some places, if the things is very bad, we may have to start from scratch. But most of the cases, we can take whatever is the working things from the, in the ULBs, start from that, add capacity, get some manpower, come up with a better plan, look at the data, look at the data quality, do some data collection and come up with this integrated waste management plan as we will talk about the different components in this particular course as we make progress.

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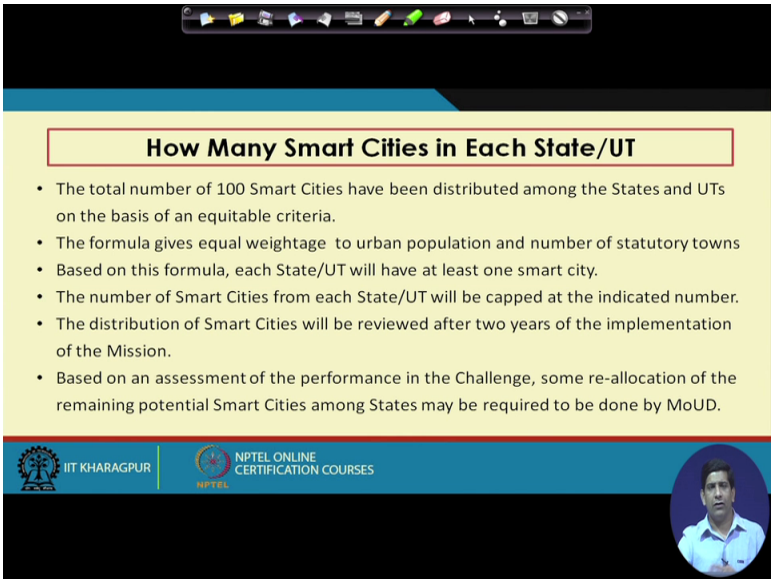


So there are 100 smart cities are there. There are, every, based on each city have at least one smart city is there. And there is, out of the first 20 smart cities, I will, we will take you to three smart cities in terms of their waste management. We will have an overview of that.

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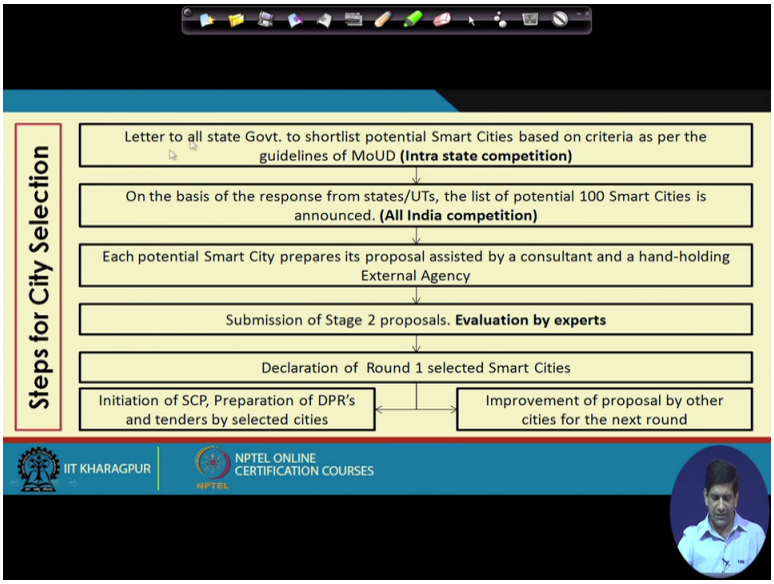


So they were some steps how the smart city was selected, we will not try to go into that, it is for you to read, it does not have that much specific for waste management.

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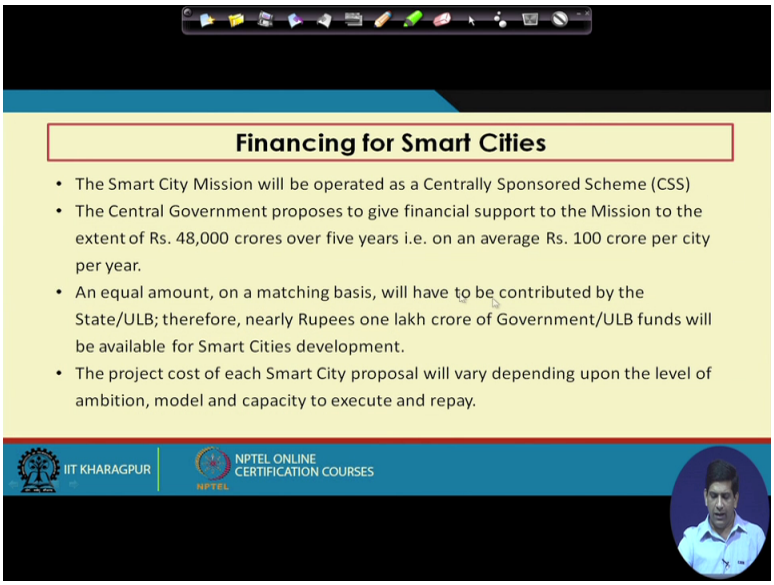


It is operated as centrally sponsored, money will come from center and then some money will come from the state as well which depend upon the level.

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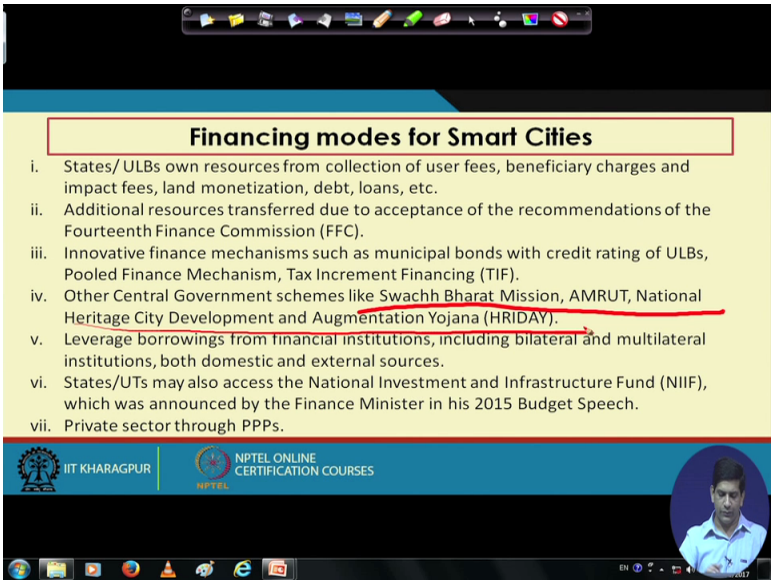


Then there is a financial model, how it will get modeled. There are lot of other schemes which will help in the Smart City like Swachh Bharat, AMRUT. As you saw those things, Swachh Bharat, AMRUT, National Heritage City Development, Augmentation Yojana, HRIDAY and all those things will help. And PPP is also there, those different financial model has been proposed.

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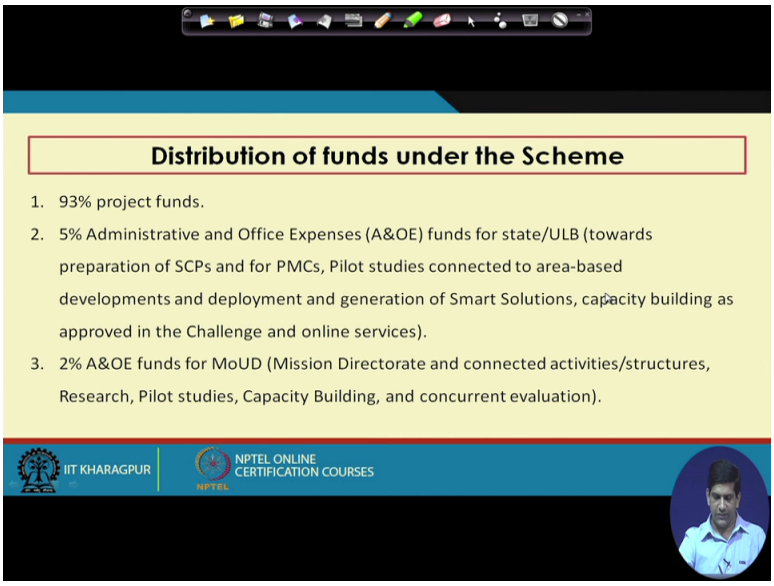


And this is 93 percent project funds, those things are there.

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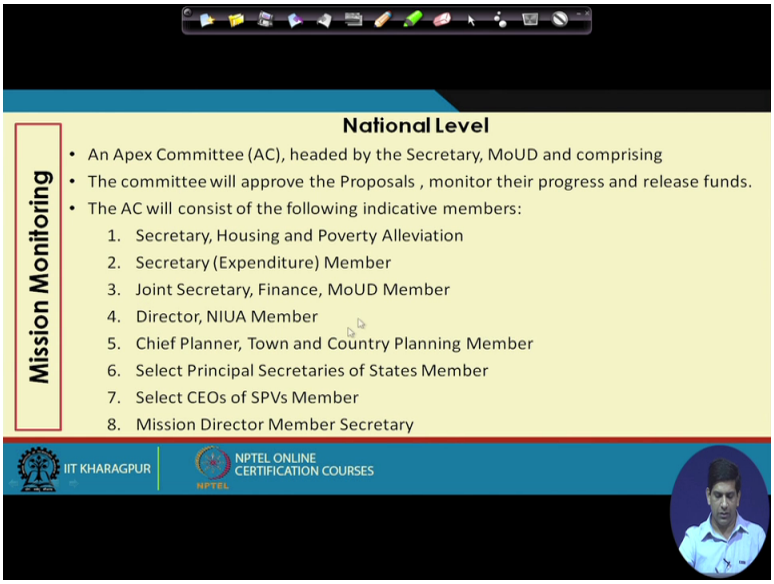


There is a national level, there is a committee, there is a mission monitoring. So there is a direct national level committee which does that in terms of the smart city.

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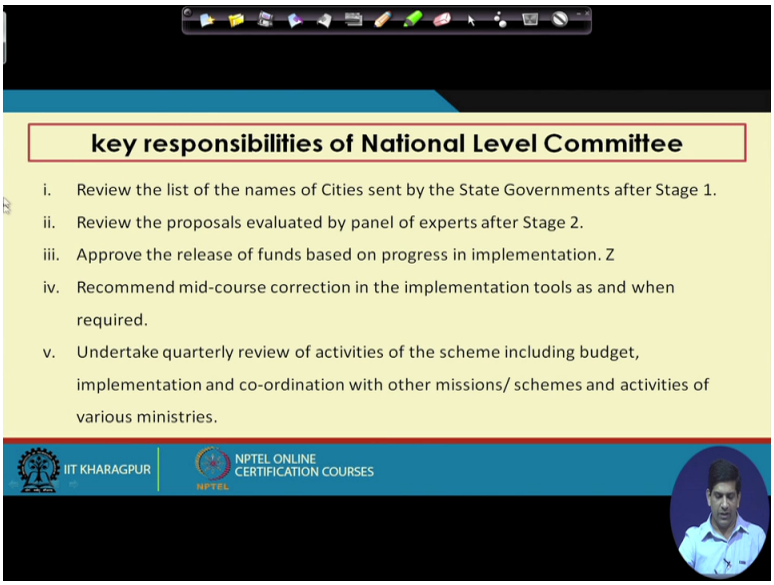


National level committee will review the list of names and then review the proposal, look at the (prop), try to look at mid-course correction if they have to, review of the activities that is happening.

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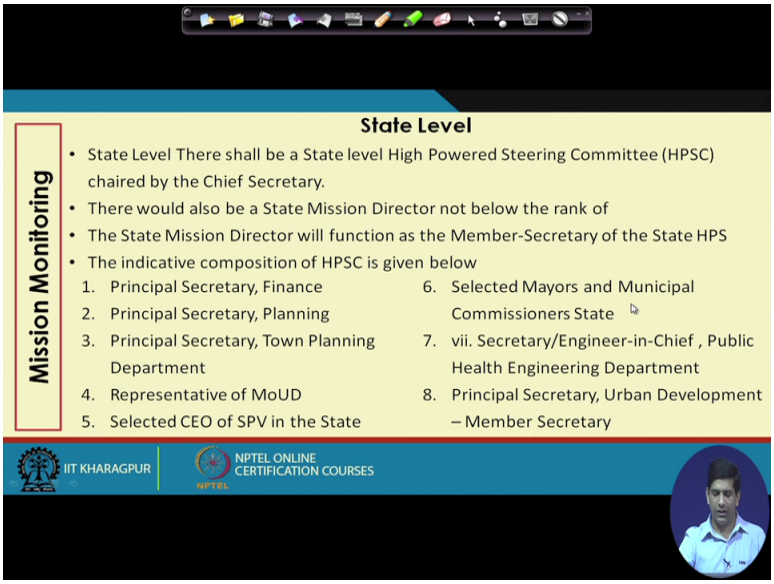


Then there is a state level committee to do that as well and where they will look at in terms of how this mission is working.

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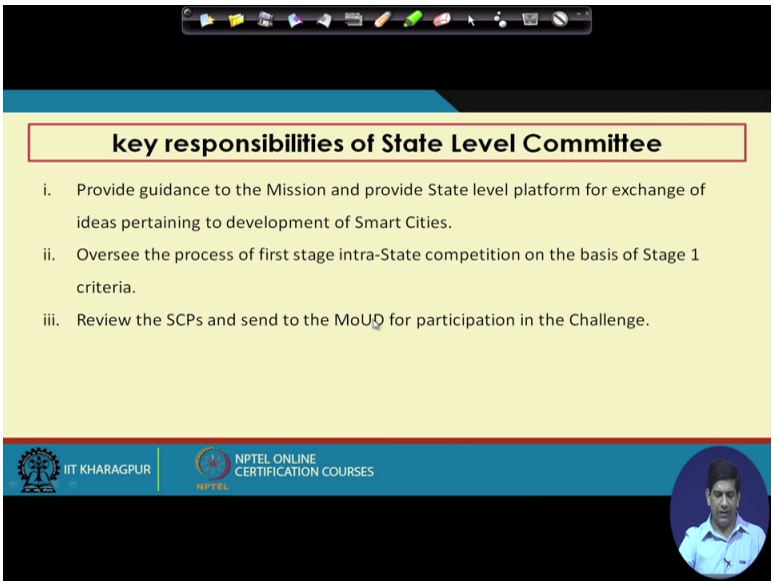


Key for the state level, again kind of do the similar thing. They have to look at the inter-state competition, review the proposals and participation for the challenge.

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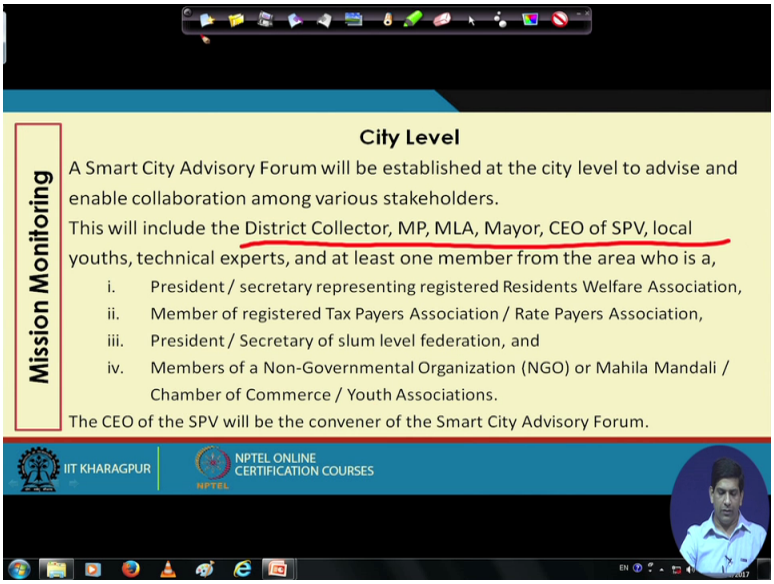


Then there is a city level. This includes district collector, MP, MLA, those people. Mayor and other things, those can be there. And different stakeholders, they can be part of that as well.

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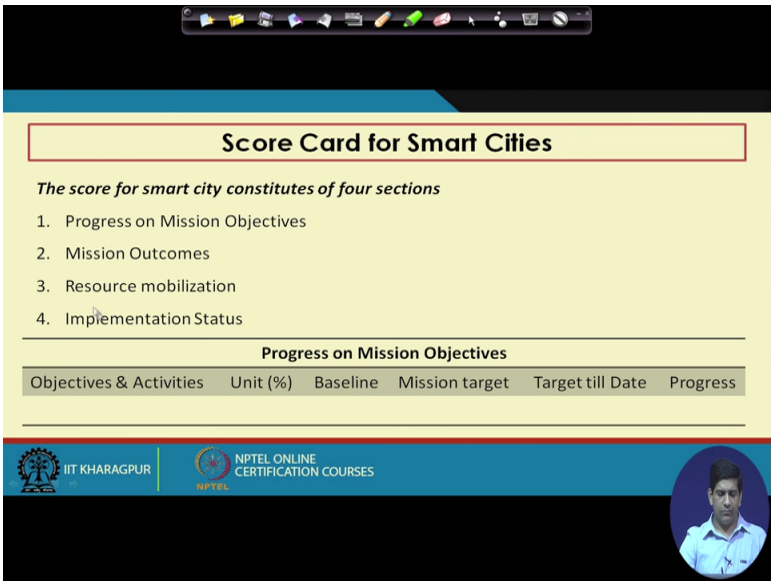

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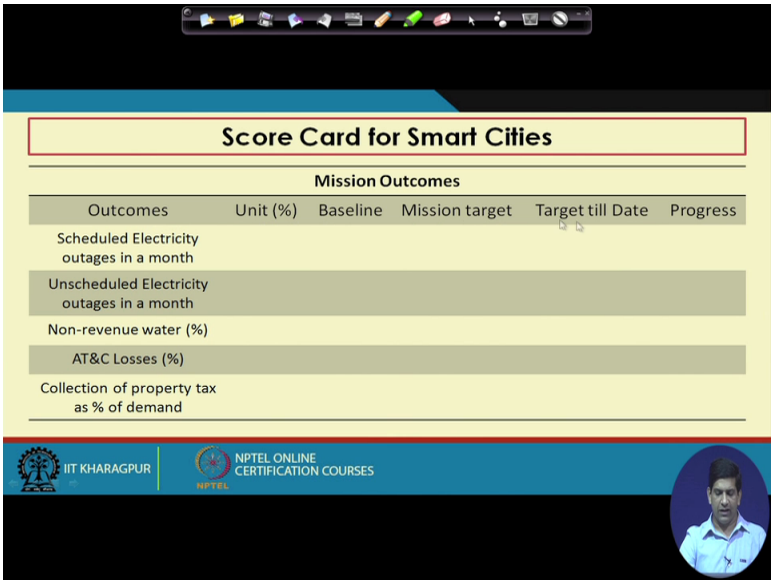


So then there is a score card based on the mission. That is how most of these smart cities have been collected like Baseline, Mission target, Target till date and all that.

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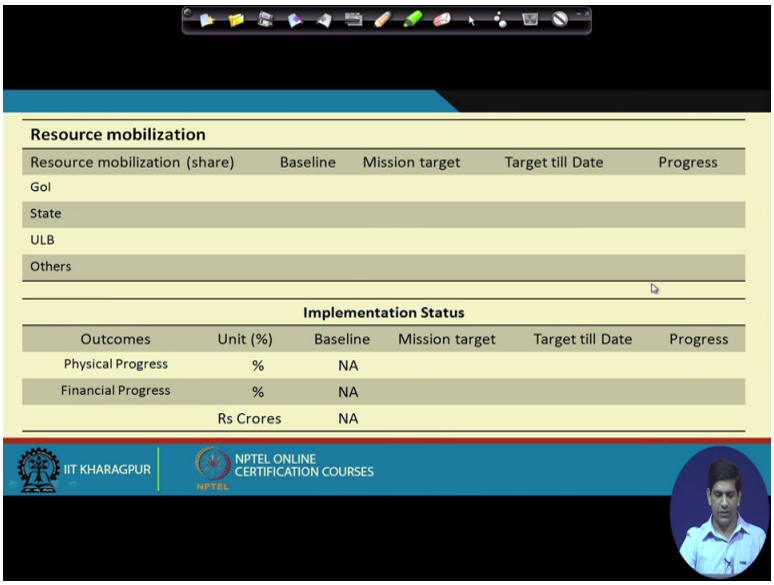

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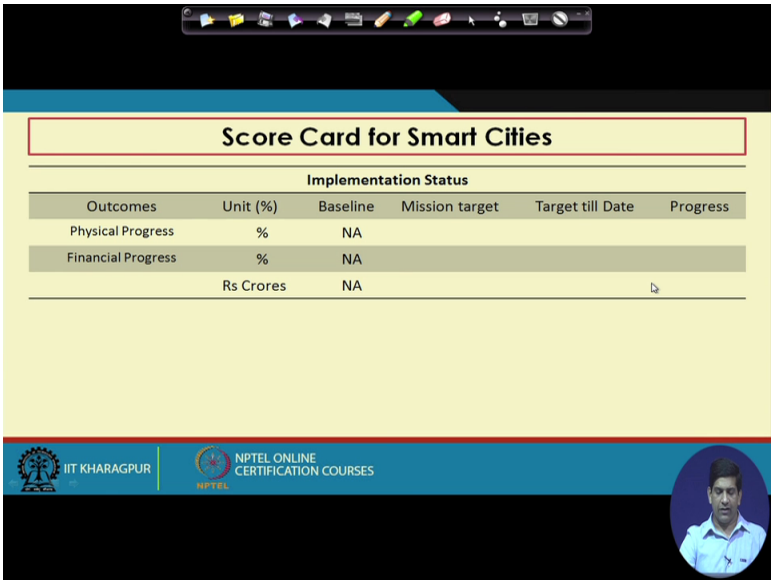


Resource mobilization, so these things again are there in that document. You can read that but what I wanted to highlight in terms of a smart city?

Swachh Bharat Mission, of course is very much in line with our waste management program. Waste management for the smart city, as I wanted to highlight that, for as you saw that out of 6 thematic area for waste management, one theme area is, sorry, 6 thematic area for the smart city, one theme area is on waste management. So for all these smart cities, we need a smart integrated waste management system.

So with that, we have kind of covered the overview of both Swachh Bharat Mission as well as the Smart City. Now in the next module, we will start going into collection of waste. So we have already talked about generation, quantities, and what are the rules, regulations, the programs. Now, we will start into in terms of collection, transport, disposal, treatment and those part of the course as we make progress. So thank you very much and I hope you are enjoying it.

Again, any questions you have, feel free to put it on the discussion board. And it will be really nice to have a two-way conversation rather you listening to the video but you need to give us feedback how we are doing in terms of this course. So you need to kind of get yourself active on the discussion board so that we can learn how you are learning. So with that, let us close this video and I will see you again in the next module. Thank you.