Plastic Waste Management
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Lecture – 12
Plastic Waste Management Rules (Contd.)

So, let us start with our lecture 12 where we will continue the discussion that we were having in the last lecture which was on Plastic Waste Management Rules. So, we were looking at how the were rules have evolved in India over environmental rules in general and then we started talking about plastic waste rules in particular.

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So, in this week again I am just trying to remind you that this week the focus is on plastic waste management rules 2016 and we will also be looking at how Indian rules compare with the global rules.

When I say global rules we will look we will look at some of the major countries like UK the US, part of US view as every state has come up trying to come up with their own rules in terms of plastic and then you know may also be looking at some other countries like Japan or Korea and some other Asian countries.

Of course, as you know we will have a separate week where we will talk about China ban. China ban and the impact of China ban global impact as well as the potential impact

on India because that is a very very important thing in terms of plastic waste which has happened in last year and we should discuss it in detail, so, because that has pretty much long term implication.

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So, plastic waste management rule just is a start where we left earlier. This is if you go online and we will be posting we will be I think it is already might be there if not it will be there. In every week we were going to post some reading resources. We had we are posting reading resources for every week and for this week three you will have a copy of this gadget of India, which is on a plastic waste management which was in came on March 18th 2016 which was a Friday when this plastic waste management rules was put in this gadget which published in the gadget after the rules are approved. So, that is a the district to show you that how it the document looks like.

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So, what were some of the salient points which we tried to talk about in the last video we will continue that discussion? As you know what we so the important things that have been done is a minimum thickness has increased from 40 to 50 microns. So, anything 50 microns and above is for now and, but that also is a is a risk, it is not that we went from 40 to 50 microns and there is no risk there; risk is still there, but of course, 40 micron is more problematic than 50 microns. So, that is the reason why we moved. Anything above 50 microns will make it much costlier as well.

So, see whenever you are looking at stuff you have to you cannot when as a engineer especially when we look at any solution when we try to design anything there are three major aspect that you need to keep in focus. Of course, one is it has to do the function for which you are designing it for.

So, the production has to be the production should be possible of that particular material. Next is of course, if you are looking if you are including the environmental performance which is important if you look at the environmental performance and at the same time you have to look at the economics. So, it is not only environment the economics also plays a very very major role. In fact, economics plays a bigger role than the environmental performance.

Because it has to make sense to the to the budget; budget of a household depending on the product or budget of a country or budget of a state budget of a big organization

whatever. So, of course, the economics plays a very major role environmental performance are being looked into in recent times and at the same time you need to look at the operational and maintenance issues of that thing as well.

So, it is an optimization of these three four parameters which helps you make a decision in terms of what system or what product or what process you will choose in any environmental and in any engineering application. So, in addition to this 40 for a 50 micron what has happened? We looked at that in the previous video the responsibility of local bodies and gram panchayat has been fixed now. There is a responsibility of the waste generator kind of a getting into it is extended producer liability or a extended producer responsibility which is called EPR.

EPR concept is being introduced which is introduced in E waste as well; Extended Producer Responsibility. What does that mean that if I the generator of plastic waste, I am generated a product which leads to plastic waste. So, I will be responsible for managing that plastic waste.

So, I have to I have to pay a part in terms of when I say pay a part not only financial , but other aspect as well. So, that is a EPR concept is being pre introduced into many things globally in Europe in some of the Asian countries the EPR concepts are coming up. Canada as well has all the EPR concept there are implementation challenges there are different models of implementation which we will also need to look into some of the EPR's that was done in for example, in Canada for electronic waste was done in a centralized way where what the date is they have all these different vendors which sells electronics kind of find a program.

But was call for example, in Ontario it was Ontario E waste stewardship program where they will be paying fun by paying money and there will be a semi government entity which will do all the job for like a kind of managing that particular help in managing those E waste as part of the EPR not. That if Samsung has their own set up, Sony has their own set up, Panasonic has their own set up rather than having that let us all this company pay in a pool of money and that poor then there would be only one set up because many times the volume is not great enough for having individual companies set up their own EPR kind of a framework.

Similar things can be done for plastic too now rather than having Lays like a Pepsi or other different companies even nowadays now if we look at the way this Patanjali is selling their product they are also contributing to many of the plastic waste which is happening in the country.

So, all these companies which are selling product which is leading to plastic waste creation can be asked to pay a certain amount of money based on the volume that the sell of those kind of products are prior and that can be put in a pool of money where a company which is x which has expertise in the waste management come in picture government helps that company with that pool of money and then that is how probably it will be a better waste man rather than expecting Pepsi and other country other companies to do their plastic waste management because the Pepsi is not peps is expertise is making the making the drinks beverage drink privilege, making chips, making different products, but their specialty is not in managing plastic waste. There are companies out there which have they are which are gaining expertise in plastic waste management

So, we should can help these companies by taking the money from these plastic wastes; I should not say plastic waste producer company I see the companies whose product actually leads to plastic waste creation. So, that is how the concept of the EPR. I think I may have made it clear if not that put it on discussion board and then also we will have some live session, where I can answer your question on that as well. So, the concept of what I am trying to advocate here is rather than having each company trying to give their own EPR framework let us bring the different companies together and we cannot leave it to the companies to do it.

Because they will never do it they will never do it, the government has to kind of handhold them and bring them on the same table try to put a dollar fee like a rupee figure that based on your turnover you have to put this much percentage in this kitty and that will fund plastic waste management programs and that can be some any companies which can come up with a with an idea which expertise to do it can be evaluated by a technical program technical committee by looking at the financial viability.

So, there has to be a process in place and that is how things will evolve that is how things have evolved in other word streams in European countries and other places as well where it of course, it takes time, but then there is a at least will be in a path which is sustainable

path which can really achieve something rather than trying to this fine, band those things actually does not work in a long term unless you have at some alternative system in place. Then responsibilities of retailers and street vendors have been put in place you saw that earlier. Registration of shop keepers you have to register; shop keepers have to register before they give this plastic waste and that also leads to some of these licenses and other stuff.

So, you think about those small [FL] where they are going to register themselves and that 4000 rupees I don't know whether they have to pay four thousand I hope they have don't they very much a smaller value for them it should be based on turnover based on money they make.

So, but the street vendor is still they are just trying to get money enough money to feed the family and to expect them to go for registration and all that and not I don't think that is going to happen. It is they it will just become a nuisance for and extra income source for the police inspectors or the police officers going around the streets and just trying to ask them ok, show me your license and it they will not have it and then they will be there will be a lot of under the table dealings there; small amounts, but do they do add up.

So, those are kind of four issues will come up unless you have a system in place for that.

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So, and the rules applies to waste generate a local body gram panchayat, manufacturers, importers, producers; so, they try to get all the stakeholders and board in there.

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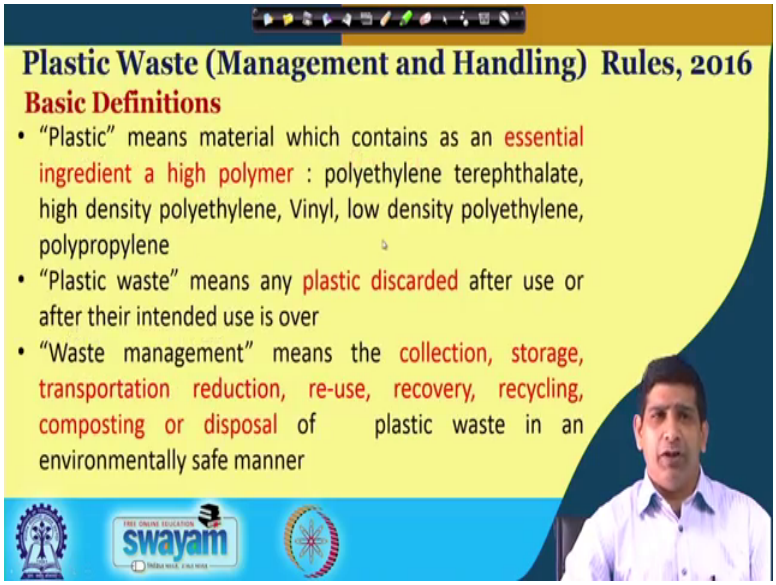

Then there are some basic definition is there. What is plastic? It is essentially means material which contains an essential ingredient or a high polymer like polyethylene, terephthalate, high density polyethylene vinyl, low density polyethylene, polypropylene; so, those are all what is plastic it is not plastic waste it is what is there in the plastic material. Now, the plastic waste means that any plastic discarded after use or after their intended use is over. So, that is your plastic waste. So, where you discard once you discard this plastic it becomes a waste.

So, waste management means the collection, storage transportation, reduction, reuse recovery, recycling, composting or disposal of plastic waste in an environmentally safe manner. Now composting or plastic waste actually not going to happen although there are some biodegradable plastic claims are there, but those plastic again when they when you look at their claims, they say it will be degrade it would be it could be composted in a industrial grade composter and I myself we are working with the city of Guelph compost facility which is in the outskirts of Toronto Ontario Canada.

And we looked at that so called biodegradable plastic degradation in a compost plant in a city compost plant and we saw that even after 2-3 cycles those biodegradable plastic

does not really degrade fully. It does get broken down, but it does not really degrade degrades.

So, it is just becomes a small small pieces it is not that they just to go away they just gets broken down into smaller pieces. So, biodegradable plastic now its can be theoretically possible, but practically still it is just it is not working in the existing system.

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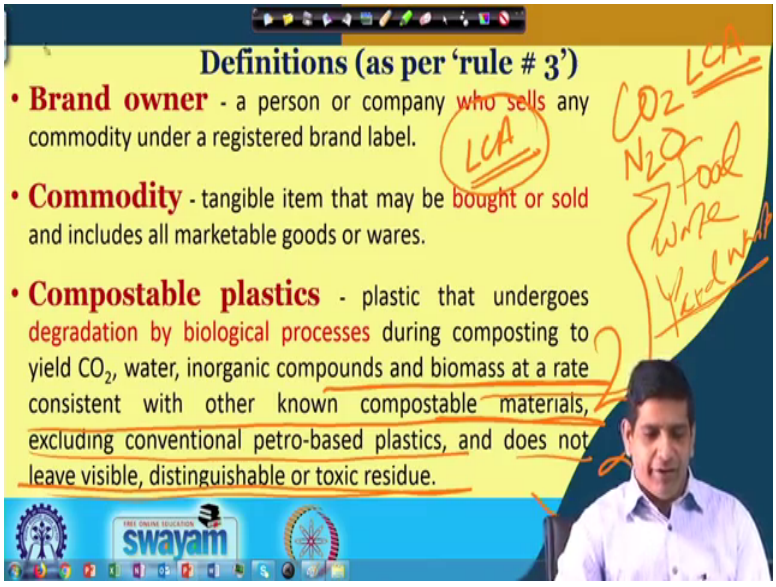

Now, brand owners have been put these are the different stakeholders the brand owner is a person or company who sells any commodity under registered brand. Commodity is the tangible item that is bought or sold into marketable goods. Compostable plastic: Plastic that undergoes degradation by biological process during composting to yield CO 2 in organic compounds biomass at a rate consistent with other compostable material.

So, that is a very interesting thing. You have to look at it is at a rate which is consistent with other known compostable material this is excluding conventional petro based plastic and does not leave visible distinguish or toxic residue. So, to have a biodegradable plastic which can do this as of today practically not possible. So, it is maybe in future, but right now I don't know I don't think there is any plastic which can degrade at a rate consistent with other non compostable materials. So, because other non compostable material includes what food waste much quicker, yard waste, again they will be they will degrade the yard waste slow slower than food waste, but it still has some lignin content that is why slower than food waste.

But it still it is it will degrade much faster than this compostable plastic because it is still led to be there yet. We will be there one day for sure I am like we have all faith on my plastic researchers and product developers around the globe that will be there one day, but those plastics are costly too. So, and when you do composting you have to look at composting with this biodegradable plastic.

If it is a carbon based which will be which predominantly it will be you will produce carbon dioxide CO 2 if you have nitrogen you may produce 2 0as well. So, they may be less harmful, but they still they are harmful. So, and you have to do that composting process and you have to make them. So, if the process will again be different.

So, you need to do something like an LCA study to look at that how much real environmental benefit you are getting out of that is it really. Of of course, it will get some benefit, but LCA study will help you today determine how much the real environmental benefit and based on the entire setup that we need to have in place for now for collecting this for post able plastics separately and taking it there some of them may make sense.

But what I am trying to say that I am not saying that compostable plastic is bad or this is bad unfortunately don't people try to do not twist or try to take things out of context. What I am trying to say is a compostable plastic even if it comes in existence will it still have some environmental impact. It may be better than traditional plastic of course, it should be that is I why we are trying to go that way and that is what our goal is.

But I will see a kind of study will help us find out how much better how much we are good we are getting after getting from non biodegradable plastic to this compostable plastic once we have them and all the system betrays which will be in place. So, having a systems approach this non biodegradable plastic it has good calorific value and if you do it in a there are some other applications which you will see in the plastic waste management system as well. So, where you will see that it can be managed properly.

So, the problem that we have today is not a plastic problem that is what I was trying to say in one of the previous video, we have a plastic waste management problem. The problem is not a plastic problem is a plastic waste. If we manage this plastic waste properly; even the existing plastic is not a bad item it is not that they are evil they are demin that is how sometimes it gets projected unfortunately it is not it is the. Since we

are as a society we have failed to manage this plastic waste properly that is what the problem is it is not the plastic which is a problem. So, you need to understand that.

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So, so, that is and the consent there are some consent there is some legal documents here consent for established operates you have to take some license. What is disintegration? The physical breakdown of the material into small fragment, but this integration is not degradation. Disintegration means it is just getting into smaller pieces. Extended producer responsibility is the responsibility of a producer for the environmentally sound management of the product until the end of it is life.

So, that is what the EPR extend for. Responsibility of it produces for the environmentally sound management and environmentally safe management facilities the premises used for collection storage recycling process in disposal.

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Importer is one it imports, holds an importer exporter code number. Institutional waste generator will be something like IIT, university, is a state government building central government buildings, hospitals, schools colleges, universities, other place organization, academy hotels, restaurants, malls shopping complexes, airports, these are all institutions. So, they are like institutional waste generator.

So, they also produce and they are also part of this with plastic waste management rules now.

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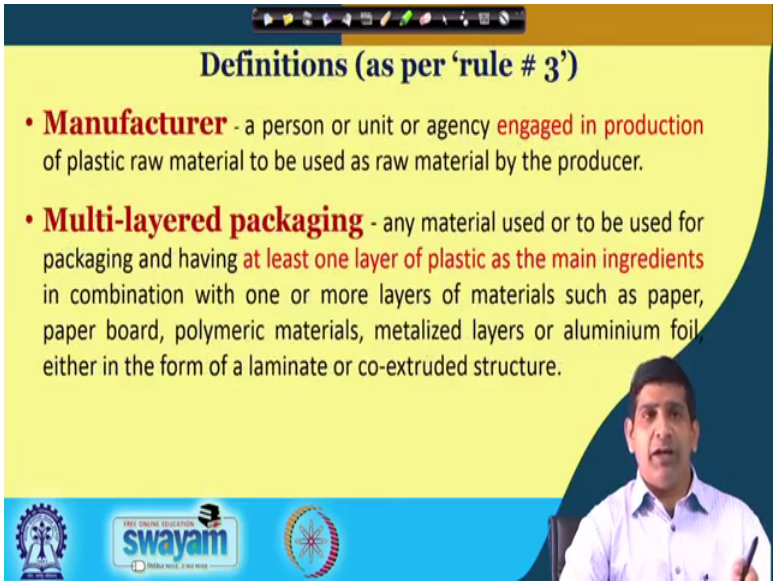

Manufacture is a person or a unit which engaged in production of plastic raw material as by the producer. Then there is a multi layered packaging, what does that mean? Any material used are you to be used for packaging having at least one layer of plastic as the main ingredients in combination with some other layers such as paper, paper boat, polymer material, metalized layers or aluminum foil, either in the form of a laminate or co extruded structure. So, you see these kind of multi layer packaging which is used for many application especially with the aluminum foil and other things we saw that a plastic do so up.

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Producer is a person which is engaged in manufacture or import of these plastic bags or bags, multi layered plastics, plastic seats or covers mates of plastic sheets, multi layered packaging, wrapping and all that recycling is the process of transforming segregated plastic waste into new product or raw material of producing new products.

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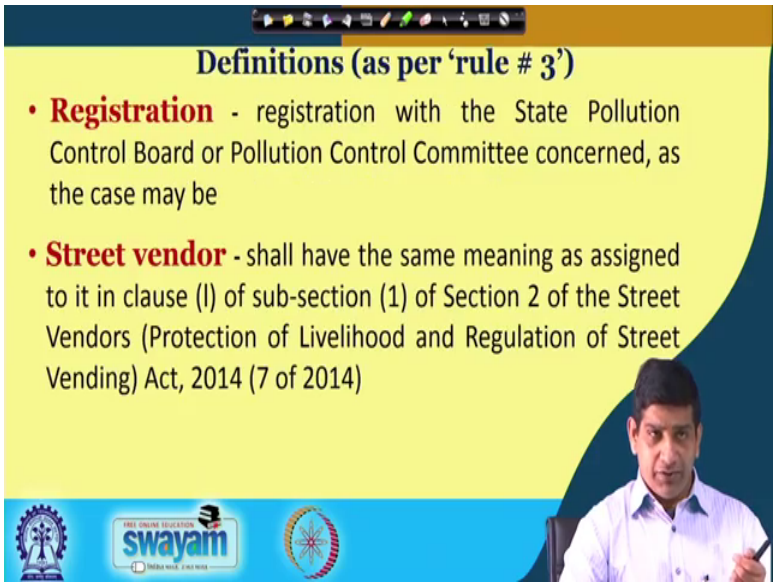

Registration again you have to register for the state pollution control board. The street vendors will have the same meaning and assigned to in clause in subsections who have a street vendor protection of livelihood regulation of a street vending act and we do not I do not want you to go in those details right now, they are not that is not our kind of mandate for this course, but one thing is that the street vendors are also covered.

So, that is what I wanted you to know.

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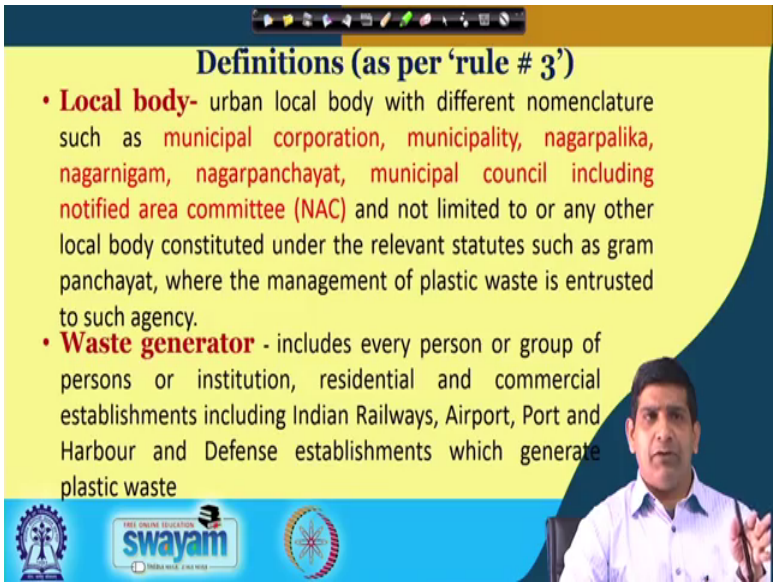

Local bodies is urban local body, ULB's with in different nomenclature based on population. It should be municipal corporation, it could be municipality, it could be nagarpalika, it could be nagarnigam, nagarpanchayat and it all depends on the population of that particular town or city and not limited to any other local body which is crumb and also with the gram panchayat plastic waste is instructed to them.

Waste generators includes each one of us, every person or group of person or institution, residential, commercial, Indian railways, air force, airport, port and harbor, defense; that is a air force military which generates plastic waste.

So, all of them are included.

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Waste management is the collection storage transportation reduction we use recovery of recycling composting or disposal of plastic waste in an environmentally safe manner. So, that is what is known as waste management. It is true for otherwise like with similar rules; similar language is therefore, E waste, similar language is there for municipal solid. Waste pickers are individual or agencies group of individuals voluntarily engaged or authorized for picking up recyclable plastic waste.

So, here essentially those ragpickers which you also talk about they that is those are the waste pickers and then we also have a group of [FL] are also there too.

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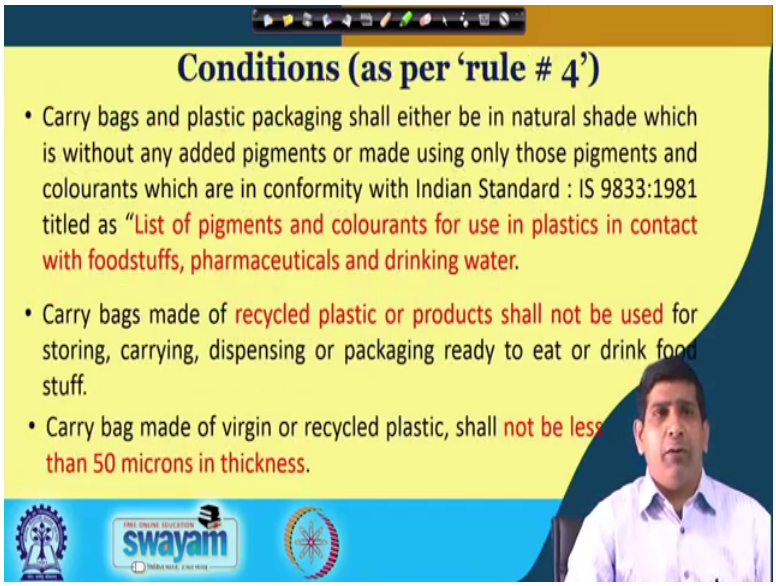

So, as you see on the top those titles like conditions as per rule number 4, these are all rule if you go to that gadget of India document which I showed you which is also there in your reading material for this particular week. They it is basically referring to that particular rule number from that gadgets and then what we have tried to do in these set of slides is try to just summarize some of this stuff from those gadgets in a way.

So, that you get the message across and it does not become too boring for you as well. So, carry bags or plastic packaging should be in natural sate, you should not too much pigments add it because pigments have those heavy metals and made only using those pigments which are as per the Indian standards.

So, there is a list of pigments and colorants because they come in contact with food stubs, they come in pharmaceuticals, drinking water pipes and all that. So, you have to have certain rules, so for that there is some rules out there. Then carry bags if it is mix for recycle plastics or products shall not be used for storing carrying dispensing packaging ready to eat or drink for diet and stuff. So, that is for recycle plastic. In many countries around the wall actually allows that. In India we don't.

But many countries around the world do allow usage of like a material of recycled plastic in these kind of containers and Germany for example, has they were they were having plastic bottles which could be washed and refilled in a Coca Cola, for Pepsi and those kind of things for a few times like 7-8, some bottles have been used up to 12 times and

so, it is not that they don't its, but in Indian context right now it is not possible to do that. Carry bag made a virgin or recycle plastic again. So, it will not be less than 50 micron. So, which is kind of the move this is the 50 micron is the size.

So, many many grocery stores now you go they do carry bags above 50 micron. So, they are bags, which is above 50 micron size and they use it instead of using those thin bags. So, this 50 micron size bags are slightly thicker, but still it is an environmental issue it is not that what 10 microns does make a difference, but again it is not that problem is gone.

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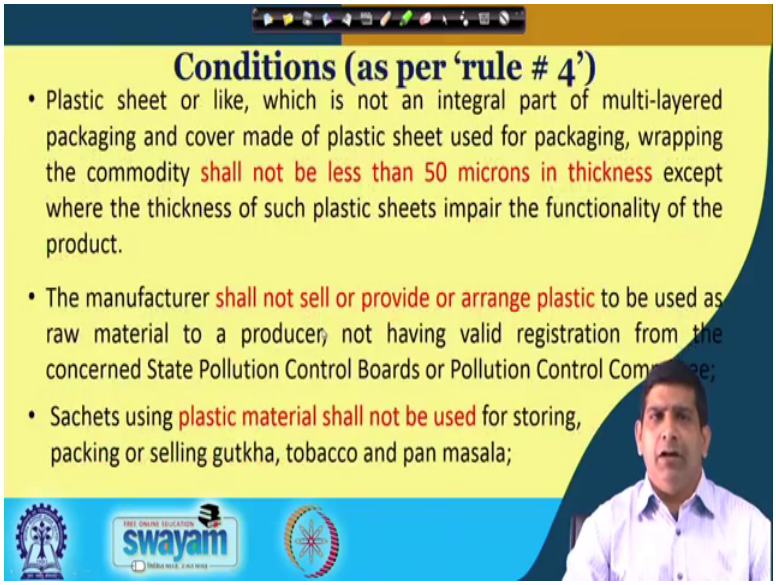

Then plastic seat which is not an integral part of metal layer packaging, plastic wrapping again they should be less than less than 50 microns in thickness except wear thickness of such plastic sheets impair their functionality. Manufacture shall not sell or provide a range plastic to be used as raw material to a producer or not having valid registration from pollution control board.

Sachet using plastic materials shall not be used for storing, packaging, selling gutka's, tobaccos or pan masalas because again for, but they do many times have very fine layer of plastic there because otherwise just with the paper kind of product, it is difficult to keep the freshness in there. There you the reason they tell plastic will act as a barrier for moisture movement and they don't want moisture to get in there and make those product get bad over time. So, that is why they are still kind of used in little bit.

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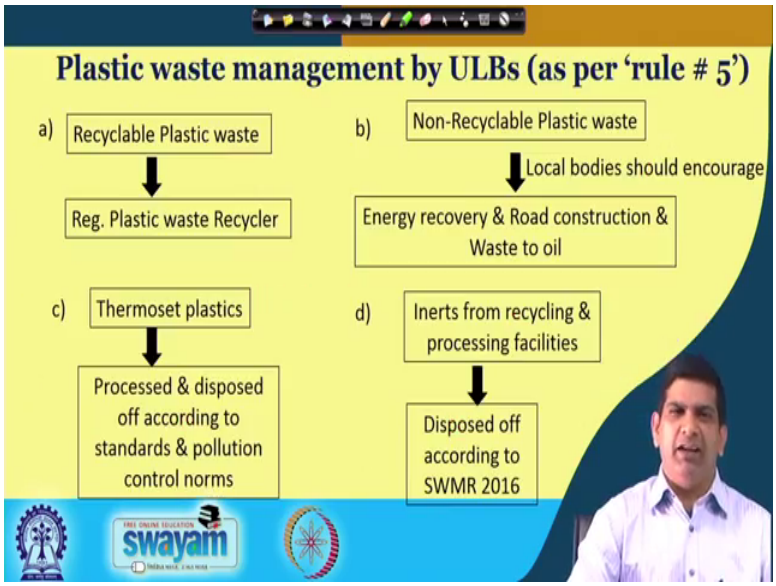

So, for ULB's they have to take recyclable plastic waste and non recyclable. Recyclable plastic waste which can go to registered plastic waste to recycle or again these things the rules have been in place for quite or more than 2 years like for almost 2 years now, but it still if to find a plastic waste registered recycler even in big cities you will not find that much. We don't have there are some for which many of them are not functional that much.

So, what I am trying to say that the focus rules are great, but at the same time lot of focuses needed in developing the infrastructure so, that these rules can really be implemented. The problem comes because we are not able to implement these rules. Rules could be strict, but if you cannot be implement there is no point of having that rule in my view. It is better to have a relatively simpler rule which is easy to implement and then add layer of complexity on top of that rather than having a very complex, very hard rule which cannot be implemented, so, the ultimate result becomes a big 0 because we cannot really do and we don't implement those rules.

So, non recyclable plastic waste, the local bodies should encourage energy recovery, road construction, waste to oil. Then thermoset plastics they say that processed and disposed of according to standards and pollution control rooms; a pollution control norm sorry and inert from recycling a processing facility dispose of ice for Solid Waste Management Rules 2016. So, that is kind of what ULB's have been advised as part of this rule as per

rule number 5 that you can do with the, this 4 broader categories for recyclable plastic, non recyclable thermoset or innards. So, this is what you can go for.

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Responsibilities have been assigned for all different stakeholders. For example, for the local body you make sure the segregation is there, collection, storage, transportation, processing. No damage is caused to the environment during this process which is kind of a very big term. Ensure channelization of recycle plastic fraction to recycler.

Now how do I don't know how they will be able to do that because it is very difficult like how to ensure channelization of recycle plastic to recyclers once we don't even know what the registered recyclers. So, first we need to have those registered recyclers. Ensuring processing and disposal or non recyclable fraction of plastic waste as per guideline from CPCB so that is again we need to have infrastructure.

For example, I want to do energy from waste , but we need to have energy from waste facility, we want to build roads from those plastic wastes we need to have roads construction being happening in that area at that particular time and property much every little bit of road every time. Because if you have to carry this plastic waste for several hundred kilometers to get this to use in road the amount of energy that you will use for transporting it that itself is will also have certain environmental footprint.

So, mean again rather we need to look at systems approach. Creating awareness among stakeholders about the responsibility; that is very very important not only awareness I will say awareness is but also giving them tools on how to implement this rule.

They teach them the technical stuff the basic technical stuff at there whatever is needed for their level of responsibility in terms of plastic waste management. Engaging civil societies and group working with waste pickers that is happening in other way stream as well and that can be done, but these things are also have limitations. Say waste management sector including this plastic waste management sector is not a very lucrative business.

We keep on talking about waste to wealth which is kind of a I feel in country like India that is practically it is kind of not really possible where you will have you will make a lot of wealth out of the waste. Once we have a good waste management system in place source segregation in place where the value there is some value in the way right. Now with all the heterogeneity mixed waste stream that we have I don't see any private party able to make a lot of money; those private parties which come they come for some other purpose. They don't have either they are unaware they are ignorant which I don't think they are.

But there could be, but at this, but most of the time they come because they just want to grab that piece of land or there is something other than making a viable working waste management system unless they go for some sort of segregation. Otherwise yeah you can go for some maybe incineration if you have enough calorific value which most of the Indian cities don't and then you can go for landfill, engineered landfill which is kind of not really a solution.

But yes, but at the present time with a mixed waste that may be one of the best option to go for, but not a long term solution ensuring that open burning of plastic waste does not take place, but how to make sure when the waste is totally mixed up and I see that there in the winter times which recently in the winter months people who are burning waste here and there and then there will be plastics in that.

So, it is it is again knowledge making people aware that why not to burn plastic. It is just saying to people that I don't open don't do open burning or plastic, but why a of course,

why what is the harm how it is going to affect my health those things people want to learn.

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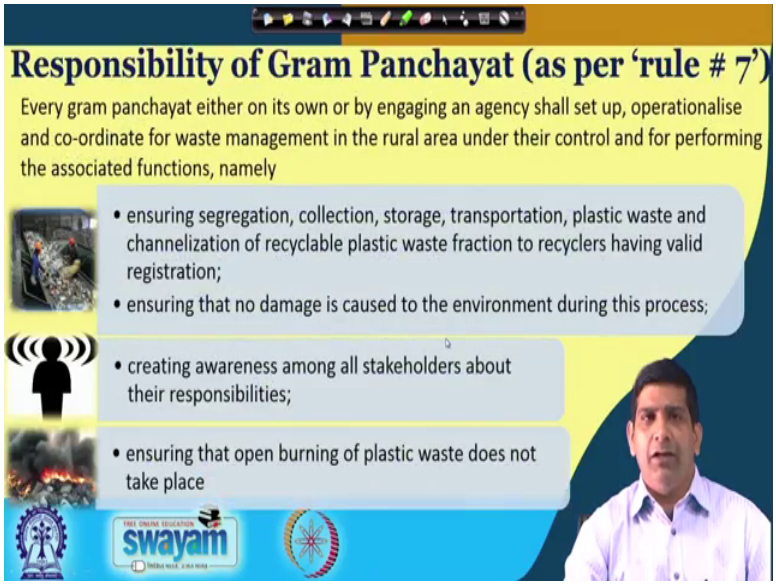

So, similarly responsibility of the gram panchayat; so, let us will with this we will go over this and then kind of close this particular video and the continued discussion in the next I think we will probably need another video to finish this rules in regulation part.

So, every gram panchayat either on it is own or engaging an agency self set up operationalize and coordinate for waste management in rural area under their control and for performing the associated functions. What are that? They have to ensure collection, a storage transportation of plastic waste, channelization of recyclable plastic waste, no damage caused to the environment which is again these are very vague terms what do you mean by no damage to the environment. Any activity you do there will be some impact, creating awareness among all stakeholders ok.

But how, who will do it, who will pay for that? Insuring that open burning of plastic does not take place, again the same thing. But see if somebody is burning plastic in their backyard how to ensure that it is not that we have to once in these can be done only through providing knowledge to the community that why plastic waste should not be burned and many of these things will be part of the municipal solid waste management rules as well.

Just doing it for plastic waste it does not really make sense, it will be for all the waste stream which is produced in the rural area which has being looked into as part of Swachh Bharat Mission, which we will you talked about in the next video. As well Swachh Bharat Mission rural, Swachh Bharat Mission urban we will talk a little bit about that in the next video and how they are also part of this whole thing because ultimately plastic waste is part of a municipal solid waste in most part, it is whether it is in rural or in urban areas. So, it will be part of the municipal solid waste management plan as well.

So, this plastic waste rule needs to be followed and become part of the municipal phase solid waste management then only otherwise we do not want a duplication of the system that will be leaking needing more resources that does not really make sense. Because the volume just for plastic waste is not there do you have a separate system altogether. So, with that let us stop here and we will be continuing discussion on the rules Indian as well as the global so, over this week.

So, we have finished lecture 12. So, we will start with lecture 13 in the next video which will be another three lectures for this particular week which then will cover the rule part. Again I will strongly encourage you to put your thoughts, put your comments, put any new reading material any new exciting articles that you come across exciting reports that you come across related to this particular course on plastic waste management. On the different aspects I put it on discussion board for the link and it will be really helpful. As I said in the beginning of the course there is no set textbook on plastic waste management.

So, we are trying to gather information from different sources collated together they are trying to put together a nice story to tell you about this plastic waste management and the goal of this particular course is actually to raise awareness about this plastic waste management, so that we can implement these rules in a nice manner in this country.

So, that is actually the ultimate goal so that people should be aware what are the real risk from plastic waste, what are the different options in which we can manage plastic waste in the country. So, with that I would close this particular video. Thank you very much and I will see you again in the next.

Thank you.