Plastic Waste Management
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Lecture - 18
Plastic Bans – China Sword Policy

So, hello and welcome back, so, we will continue our discussion that we were having on a Plastic Ban. And if you remember, we talked about plastic ban in India and some other countries so far. Now, in for the remaining part of this particular week, we will be focusing most on China's policy which has an implication throughout the world including India.

So, this China Sword Policy, we will talk about that in little bit in detail and how this is impacting our plastic waste management and not only plastic waste other waste management issues as well. But, for this course since we are focusing on plastic, we will talk more about that we may touch upon some other waste stream too.

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So, let us get started. So, in terms of this China sword policy China has a has put a National Sword 2017 which is the Crack down on Waste Import. Now, what does that mean is as you know that major manufacturing these days happens in developing countries emerging economies. And, China being one of the most important of those emerging economies there is a lot lots and lots of manufacture happens in China; if you

compare China in India Chinese are much head in terms of manufacturing we are we do lot of service industry that like software's and those kind of industry more in India, but in China it is more a factories manufacturing does happens more over there. So, lots of factories. So, factory requires raw material and when you require raw material you need raw material from different sources.

And one of the source is coming from waste material. So, these waste materials from developed countries like US, Canada, Australia, New Zealand, and European Union. Once they have collected the recyclables those recyclables most like good portion of those recyclables used to end up in China for processing and resource recovery and that resource used to go in Chinese manufacturing plants. Because, that is where the demand are in terms of a manufacturing, but as China itself started focusing on recycling within it is own country and with a huge population1.3 billion people they started having their own recyclables up to it is up to a good quantity.

So, they the reliance or the dependence on the recyclables from the foreign countries from the developed countries are gradually going down so. So, now, China wants to take your recyclables only if it is clean. So, they do not will they, they want that it has to be clean not the dirty recyclables. So, if you do not do the recycling, sorting and all that source separation is not proper and there is a contamination in the recyclables they will not take it. So, that is what the whole concept behind this China Sword Policy and we will discuss this in more detail. So, that is it is kind of there also call it second Green Fence. So, it is a second green fence as some people call it as a second green fence.

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So, what is that National Sword Policy, what are the different stuff is in there. So, there are 24 items of waste banned by China that they will not take it into their country. Eight categories of plastic waste covering LDPE, HDPE, PET, PVC, PS from living sources like post consumer. So, post consumer plastic waste which has a chances of more contamination China say that will not going to take it. So, that is a these are the waste ban. One type of paper waste which is the unsorted mixed paper, unsorted mixed paper because see if you do lot of sorting that requires lot of energy, that requires lot of manpower, that requires lot of money.

So, it gets costly, to make the waste sorted into different categories and that makes the waste a good value that is the recovered material has a good value is of good quality and of course, you have to invest money to do that. So, there has been a practice of rather than investing money say in Australia or in the in US or in Canada; many of these municipalities since they could send those ways to China earlier they were and to do those due diligence I may call it within their own jurisdiction was stepping out to be costlier than sending it off to China.

So, that is what they were sending this mixed paper and we get those unsorted mixed paper even in India like I have seen that in there is one Krishna Tissues Plant nearby in near Kolkata area where, I saw some of this waste papers mixed waste paper coming from UK, coming from Australia and they produce the recycle those and they produce

paper tissues and lot of other products out of that even packaging paper and all those things. So, but they do not want mixed paper eleven types of textile waste. So, they do not want textile waste eleven types not clothing and four types of metal slag containing vanadium. So, those were banned. So, they so, these are these were totally banned they do not want those and they also put a new standard limiting all imported recycled material to a maximum contamination level of 0.5 percent which is pretty very strict regulation. Earlier it was their goal was to have 0.3 percent, but then they settle for 0.5 percent.

So, what does that mean? Say if we have one kg hundred kg of recyclable plastic or recyclable paper coming into China which is being sent to China for recycling and resource recovery out of the hundred kg, 0.5 kg 0.5 percent. So, it cannot be more than 0.5 kg of contamination. So, 99.5 kg has to be the clean paper. So, that is a good like a very very tough demand to meet by many of the unless these recyclable recycling companies in developing countries all those countries which used to send those plastics or papers and other recyclables to china is start putting lot of efforts on there.

So, there is a lot of debate lot of term is going on in the world in terms of this China ban or China's condition that you need to have a you can maximum you can have is 0.5 percent you cannot have more than that otherwise your lord where your load will be rejected it will be sent back. So, that is creating a lot of investment it is going is happening or going to happen in recycling business in these countries like US, Canada, Australia, New Zealand and European Union and other places.

So, that is which whichever are used to. So, the countries which used to send their recyclables to china and, but in trim while they do all these things or in their own country they are also looking for alternative markets which you talk about because, of the aftermath of China ban is actually problematic for country like India. Because we will really start getting lot of these contaminated recyclables coming to our country which will be of have which will have a bigger environmental footprint.

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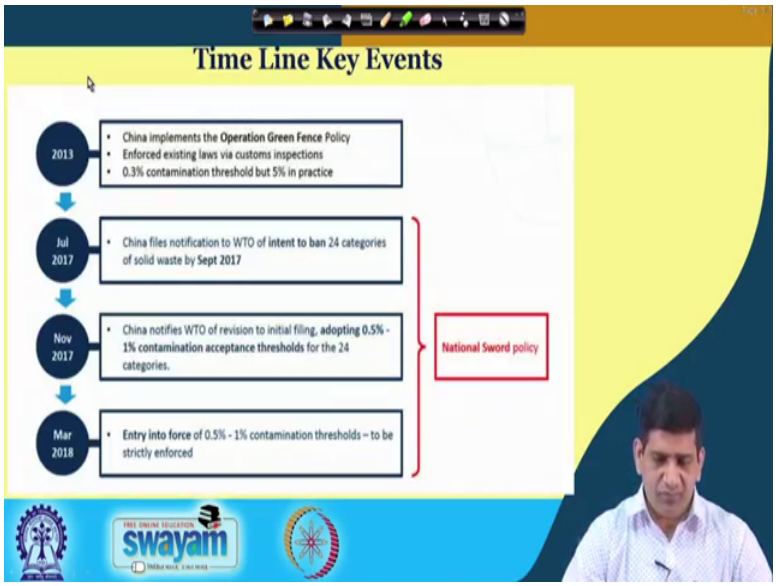

So, what does just look at the timeline what the date. So, they started they do not see these things does not happen overnight it takes time so, started in 2013. So, China implements the Operation Green Fence Policy they enforce existing laws via customs inspection 0.3 percent contaminated threshold, but 5 percent in practice. So, they were saying that 0.3 percent will go there, but up to 5 percent they were they were taking it. July 2017 China files notification to World Trade Organization WTO or to ban 24 categories that we just looked in a previous slide or by September 2017.

November, China notifies WTO of a revision of initial filing adopting 0.5 percent to 1 percent contamination acceptance threshold for the 24 categories those which were banned. March 2018 entry into the force of 0.5 percent or to 1 percent contaminated threshold to be strictly enforced. So, this whole thing together is called National Sword Policy that is what it is known as. So, around 0.5 percent is what they are trying to enforce.

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So, 2013 as I said there was focus on quality, they were more on trying to get better plastic. 2017 National Sword is they have had to eliminate illegal waste smuggling. There was bans on 2014 material including mixed paper and mixed plastics which we saw that, there is a Contamination limit announced that 0.5 percent contamination limit. They have also suspended license so, Chinese government began limiting license (Refer Time: 09:36) to closed down mills in China which were not following these rules.

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So, in 2018 which was this past year in January 2018 bans came in effect March 0.5 percent contamination limit came in effect were there was operation BLUE SKY Chinese customs to inspect all loads at point of entry into China in effect through 2018. May 2018 suspended all inspection of US imports since the inspections are required all exposed to China stopped, regardless of quality stressing markets across the globe. So, you cannot send this contaminated stuff to China anymore. June 2018 China allowed shipment with the inspection and some ships on where were the water for non banned material.

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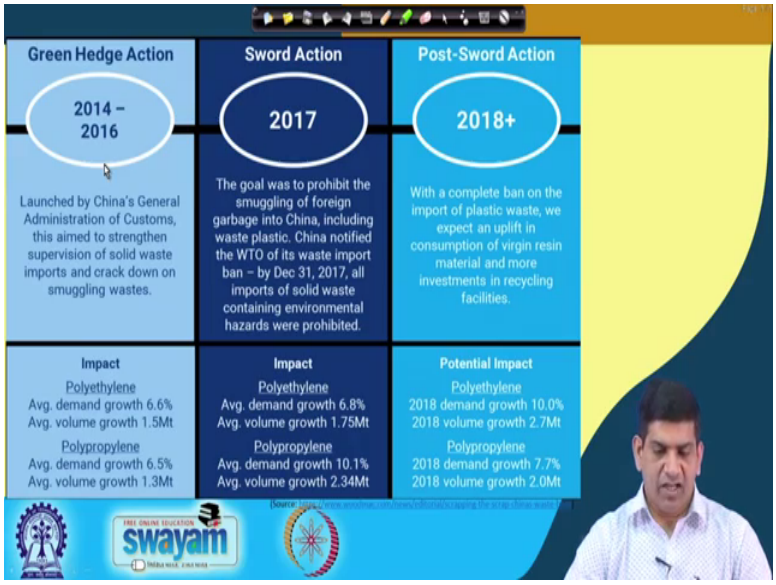

So, if you look at some of the other like actions. So, it started if you initially from 2014 if you look at the time line 2014 to 2016 then 2017 there was and then 2018 plus. So, 14 to 16 there was China's customs department is where trying to strengthen the supervision of solid waste imports and crackdown on a smuggling waste which they used to get a lot of them there was impact on Polyethylene. And Polypropylene where average demand there was a growth in average demand, average volume also grow and there was around 6.5 - 6. 6 percent growth and you see more volume of those material.

Then in 2017 the Sword action the goal was to prohibit the smuggling of foreign garbage into China including waste plastic which we just talked about that any the they informed WTO that all imports to solid waste containing environmental hazards are going to be prohibited and then there was a demand average demand growth in terms of

Polyethylene and Polypropylene as you can see there was a growth in volume then a Post Sword action with a complete ban on the import of plastic waste with expect an uplift in the consumption of virgin resins material and more investment in recycling facilities. So, that is there was a growth of around 10 percent volume growth is 2. 7 ton, Polypropylene demand growth was 7.7 percent and the volume growth was 2 million tons.

So, with the ban on plastics recyclable so, we got lot of lot virgin materials coming into the market. So, more stuff getting into the market of course, somebody has to look at in terms of what is the real when we talk about this China short ban what is the real environmental footprint of this whole activity. Because it is not just what is not coming into China what is happening with those material now, some places I have read newspapers reports or the some technical articles report which suggest that many of these are not going to the to the waste to energy plants. So, it is not getting recycled it is going to the waste to energy plan.

So, is it really a like is it good thing to do or should be had not be in recycle that have been better. So, we have to come some of this would be a very beautiful kind of a lifecycle analysis kind of exercise where we can see what is the impact of China Sword ban on Global Recyclable Industry and based on the actions that the global recycling industries are taking what is the real environmental benefit are we really getting environmental benefit or of course, China locally is may be benefiting from it, but is it really helping the global environmental cause or is it a positive development or is it a negative development and so that those things would be interesting to look at.

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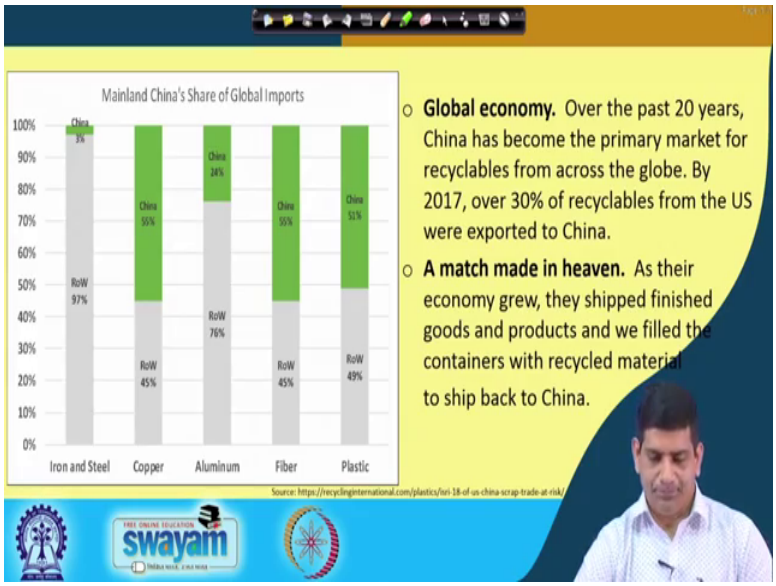

So, if you look at the Global economy and in terms of mainland China's share of global imports. So, in terms of the import 3 percent like Iron and Steel since China makes a lot of Iron and Steel by itself. So, over the past 20 years China has become the primary market for recyclables from across the globe by 2017 30 percent of recyclables from the US were exported to China as their economy grew the shipped finished goods and products and we filled the containers with recycled material to ship back to China. So, that goods will go to US and big other big countries those containers those shipping containers will fill in the recyclable waste and then bring it back to China for processing and reuse.

So, as you can see Iron and Steel import was 3 percent and rest of the world is 97 percent then if you look at Copper China was importing 55 percent well rest of the world 45 percent then aluminum 24 percent like more than one fourth of the world nearly one forth Fibers more than 50 percent Plastic more than 50 percent. So, as you can see in terms of the recyclables Iron and Steel, Copper, Aluminum Fiber and Plastic. Plastic fibers and copper more and more was getting into China.

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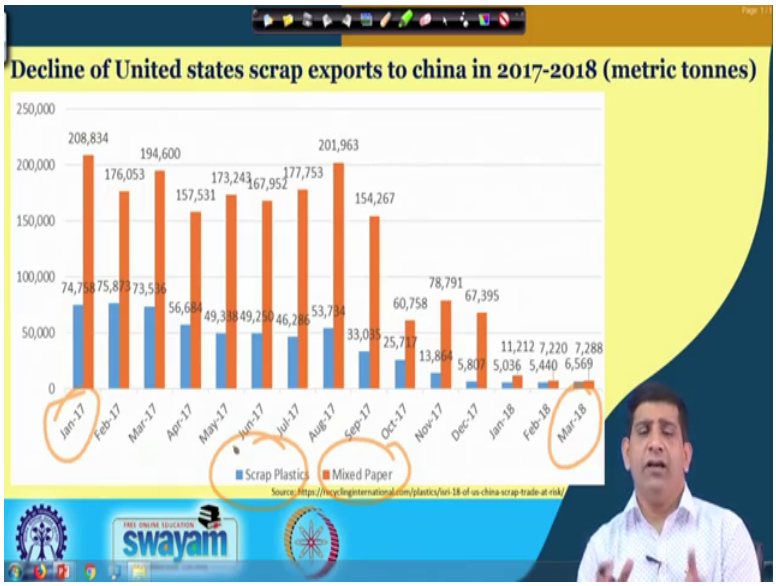

Now, in once with this these rules come into effect we see that there was a kind of a declining trend in terms of x prize scrap exports to China in 2017 2018 these values are in metric tons and you do not have to worry too much about the values we were what we are looking at is just the trend.

So, if you look at from in this particular graph if we start from January 17 to march 2018 which is a period of around 13 14 months as you can see and this orange one is our the Mixed Paper the blue is the Scrap Plastic. So, let us look at the blue first and as you can. So, blue has a tendency of kind of going down especially after we have China ban a Sword is effective we see kind of a drastic drop and. So, that is the values going down and these values are in metric ton as I said earlier and similarly if you look at the mixed paper they also have a tendon have kind of a that there was a sword decline of mixed paper.

So, thing is that why there is a decline this plastic and those recyclables material recycling facilities in US is not able to keep it clean to the standard that China wants it. So, since they cannot keep it clean China will not take it. So, only the materials which were clean were allowed the materials which were not clean was not sent. So, that is export of recyclable has gone down now the question is what will happen to those recyclables in US because US for the last 2 decades or two and half decades is or I am just using US as an example US, Canada, European Union, Australia, New Zealand all

those countries for last 2 or 2 to 2 decades they have relied on China in terms of managing their waste in managing their recyclables.

Now, all of a sudden if it is stops and there is no capacity to handle these kind of waste any more left in US industry what will happen to those recyclables in the end trim they will probably like to go for some other markets like India Indonesia Malaysia which will which will looked at. But, at the same time it will force the local industry to grow in this particular area because that is where they have to start yeah they have to start like a managing their waste within their own boundaries rather than sending it off.

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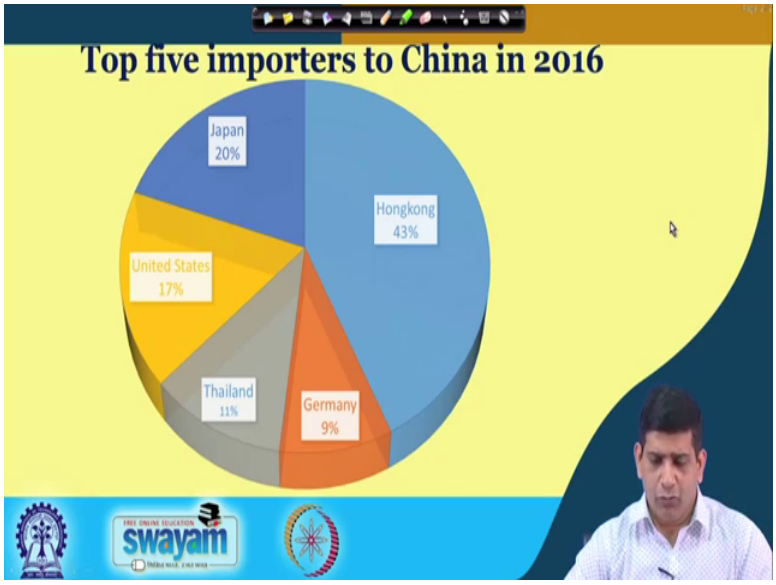

So, to top five importers to china in 2016 you have a Hong Kong 43 percent. Now this Hong Kong business is most of it is actually coming from other developing countries through Hong Kong. So, because there are certain loopholes all the rules in regulation that is why it kind of makes a huge chunk of it goes through the Hong Kong, but nearly 43 percent. So, that these 43 percent probably coming mostly from US, Canada or European Union and other places. So, Japan 20 percent, US 17 percent, Thailand 11 percent and Germany is 9 percent. So, that is the importer of waste coming into in China.

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So, to the top five export destination for top 5 historical exporters. So, if you look at the historical exporters from Germany most of it goes to China part of it just goes managed in other European countries as well and India 6 percent the orange the yellowish orange pie is the Indian pie. So, you can see that it is around 6 percent for the German export German waste export, USA 5 percent for India China is 56 percent. So, that is a lot of 56 percent of the recyclables are going to China, Canada little bit 3 percent, Hong Kong and is around 32 percent most of it will again end up to China.

So, this as you can this number is a again pop most of it will end up showing up in China as well. So, as you can see China is kind of dominating 56 percent for 30 69 percent 56 percent and Japan again 17 percent and then they also have 8 percent here which part of it will it may end up over there as well Vietnam 26 percent, Taiwan South Korea. So, now, with China gone of this pie of most of for most part or the values going very low for the other destinations obvious destinations that you see is Taiwan, Vietnam India, Mexico those are the countries where you start seeing many of these recyclables being ending up.

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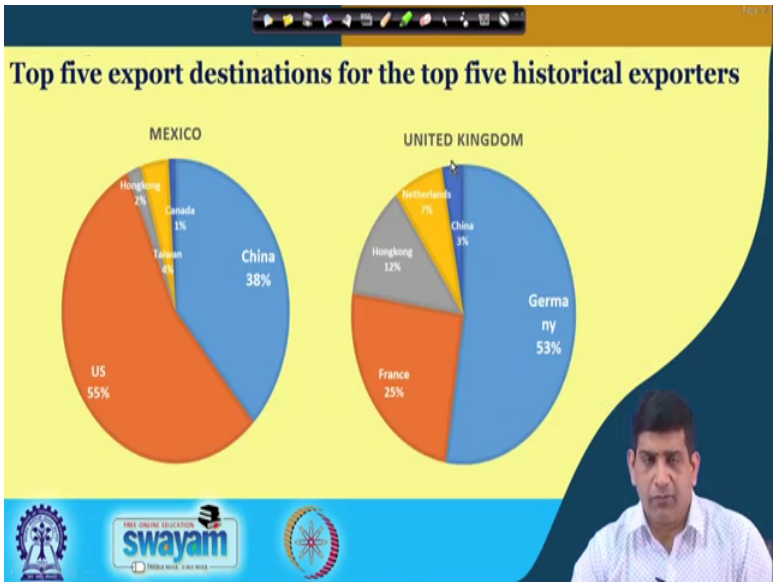

So, that is what is kind of a little bit of concern as because in India we do not have the infrastructure to deal with these recyclables if we get right now a lot of these recyclables coming in to handle and process. So, we will have a lot of environmental issues associated with that as well.

So, Mexico in terms of what they send to 5 export destination for the top 5 historical exporter Mexico they are sending around 38 percent to China, 55 percent to US because that is the in the border area probably they are managing it in the United States Canada, Taiwan and Hong Kong because the US has the capacity to manage that. So, that is probably why it is ending up over there if you look at the UK, Germany 53 percent, China 3 percent, and Nether land 7 Hong Kong 12 and France is 15 percent 25 percent. So, Hong Kong is again kind of partly going through the China as well.

Germany because they are using they have lot of recycling facilities and all that UK struggles with the waste management a little bit as compared to the other the European countries. So, if they do send lot of stuff to other European countries to manage.

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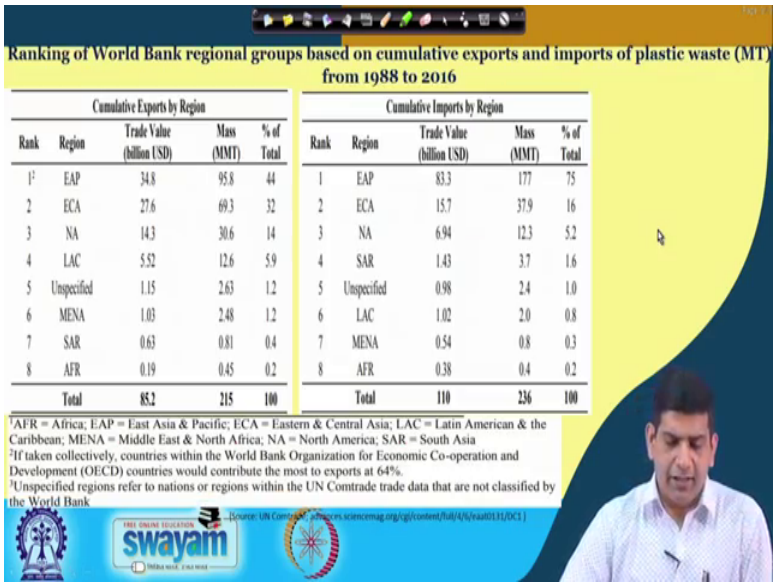

So, if you look at ranking of the World Bank regional groups based on the cumulative exports and imports of plastic waste from 1988 to 2016 so kind of for the very beginning to the very recent data. So, there are different regions have been identified a EAP is our East Asian Pacific, ECA is Eastern and Central Asia, NA is North America, LAC is Latin America and the Caribbean's then there is some unspecified MENA is the Middle East and North Africa, SAR is South Asia and AFR is Africa. So, that is what you have the list on your on your on the table on the left as you can see these are the different regions that is been identified over there.

So, and then for each of those there is a trade value there is the mass and then the percent total and. So, this is one export then there is also one imports where the same regions have been given mass and percent of total. So, if you just look at quickly on this particular table. So, for if you go by exports first so, in exports as you can see our East Asia and Pacific kind of leads it. So, the ranking is also there on the leftmost on the both the table that is the ranking. So, 44 percent 44 percent is the export from East Asia and Pacific and compared to if you look at the import East Asian pacific also imports 75 percent.

So, although it is exports 44 percent, but it imports 75 percent. So, net actually becomes more of an import rather than an export. So, that is where we have a kind of a gap almost 31 percent gap between imports and exports. So, which is that is which not very healthy

because that is what leads to lot of problem in terms of foreign currency reserves and all that. So, next that ECA which is Eastern and Central Asia which kind of is in the middle on both the table in the second position on both the table and. So, import export is 32 percent and the import is 16 percent. So, what is says that is that is actually better then North Africa 14 percent is the export then 5.2 percent is the import then LAC which is a Latin American Caribbean and unspecified MENA. So, for each of those reasons you can see there is and this is for the export and import of plastic waste. So, it depends on your usage in this area for plastic as well.

So, in for both the examples we see that there is a substantial amount of plastic waste which is coming from East Asia and Pacific being exported as well as imported and there are other countries out there as well.

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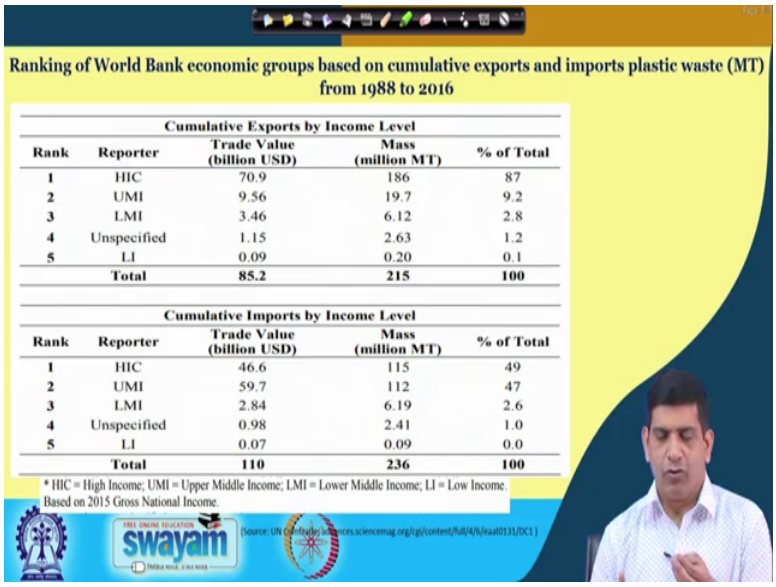

So, being said that if you look at also the ranking of World Bank economic groups based on the cumulative exports and imports of plastic waste. So, here High Income group, Upper Middle group, Lower Middle group and Low Income group based on 2015 GDP or sorry which is the gross national income. So, if you can divide that what we see is this high income group has nearly 87 percent values in terms of exports what is happening. So, high income group is able to spend more time in terms of separation of the garbage and all that and making it convenient for to be recycled then upper income is around 10

percent 9.2 percent, lower mid income is 2. 8 percent then we have low income based on group that is it is around point one percent.

So, similarly if you look at the import part we have again HIC which is the high income group 49 percent and that low income group is close to 0 percent or one percent. So, what does it mean is it essentially is trying to tell us that it if you look at like a financially the countries which are bit financially well off they have more money to spend. So, and then those countries you see more progress those who are still struggling with poverty and all those kind of stuff they struggle in terms of delivering this waste management facilities. So, that is where we do not get the number. So, the numbers are pretty low or numbers are in the informal sector we do not have those numbers in a in a government database or any report which we can use.

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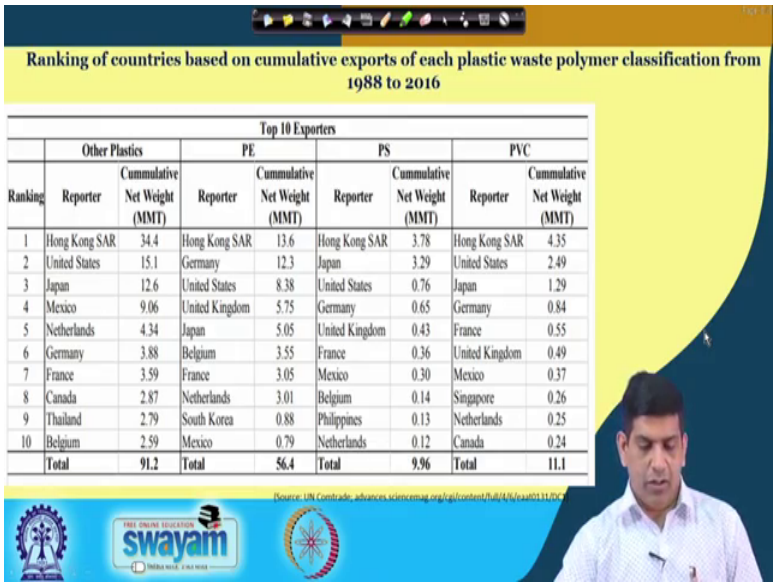

Top 10 Exporters								
	Other Plastics		PE		PS		PVC	
Ranking	Reporter	Cummulative Net Weight (MMT)	Reporter	Cummulative Net Weight (MMT)	Reporter	Cummulative Net Weight (MMT)	Reporter	Cummulative Net Weight (MMT)
1	Hong Kong SAR	34.4	Hong Kong SAR	13.6	Hong Kong SAR	3.78	Hong Kong SAR	4.35
2	United States	15.1	Germany	12.3	Japan	3.29	United States	2.49
3	Japan	12.6	United States	8.38	United States	0.76	Japan	1.29
4	Mexico	9.06	United Kingdom	5.75	Germany	0.65	Germany	0.84
5	Netherlands	4.34	Japan	5.05	United Kingdom	0.43	France	0.55
6	Germany	3.88	Belgium	3.55	France	0.36	United Kingdom	0.49
7	France	3.59	France	3.05	Mexico	0.30	Mexico	0.37
8	Canada	2.87	Netherlands	3.01	Belgium	0.14	Singapore	0.26
9	Thailand	2.79	South Korea	0.88	Philippines	0.13	Netherlands	0.25
10	Belgium	2.59	Mexico	0.79	Netherlands	0.12	Canada	0.24
	Total	91.2	Total	56.4	Total	9.96	Total	11.1

Now, if you look at ranking of countries based on cumulative export for each plastic waste polymer classification; so, again from 1988 to 2016. So, here if you look at PE, PS PV, PVC and other plastics; so, you have Hong Kong and Hong Kong which is gets lot of business sale on that line. So, we have a cumulative net weight for other plastics in Hong Kong is thirty 4.4 million metric tons. So, and then PE is around 13.6, Hong Kong SAR is 3.78 and then Hong Kong SAR another one is 4.35 for PS and PVC. So, PE 13.6 Polystyrene 3.78, PVC is 4.35 and these are all million metric tons.

So, that is in terms of the different ones then you have the US, Japan, Mexico, Netherlands, Germany, France Canada, Thailand and Belgium. So, as you can see in terms of the top 10 exporters they do add up to around 91.2 million metric tons for other plastic 56.4 metric million metric tons for Polystyrene Polyethylene then we have PolyesterLENE and then we have the PVC.

So, it is in terms of the polymer criteria for polymer classification criteria from 1988 to 2016 we see that there are that there are different countries which are exporting of the garbage as well as the importing the garbage of plastic waste from different sources.

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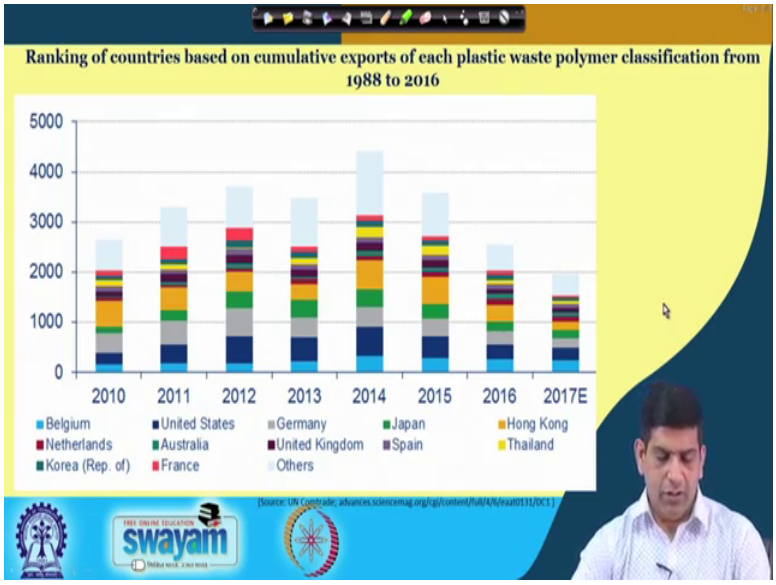

Now if you look at the same similar examples based on like for the European Union itself like Belgium, Netherlands and then some other countries like us Australia, Germany, UK, Hong Kong and Thailand. So, as you can see over here from 2010 to 20 2017 we PC that the biggest chunk actually coming from the grey which is the Germany then the yellow which is Thailand and as well as the Hong Kong. So, you and of course, Belgium, United States they are kind of pretty at the bottom over there.

So, what does this mean is if you look at for each plastic type there are different countries which are using that two different levels and then they kind of gets exported imported from one country to the another.

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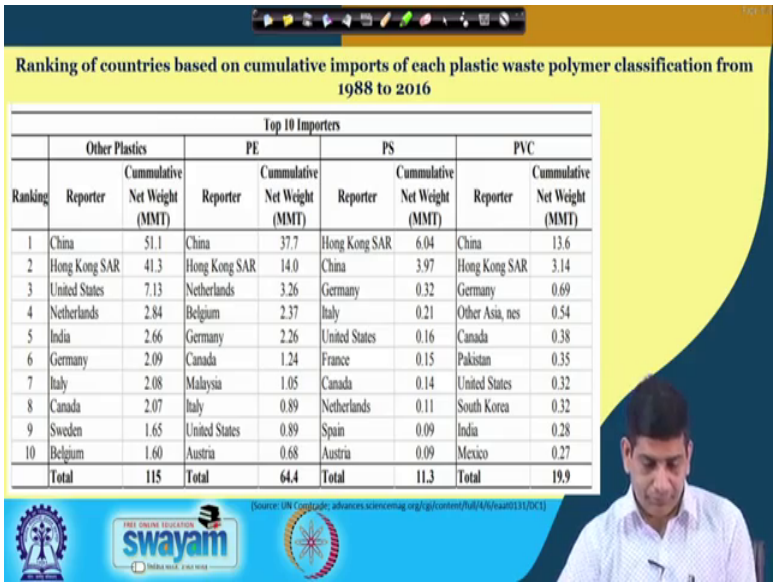

Now, ranking of countries based on cumulative import of each plastic waste; so, if you look at that earlier one was on export now if you look at the import channel it is the pack most part then we have Hong Kong then us also imports certain types of plastic and we have India there we have Italy we have Canada, Sweden, Belgium. So, for other plastics then polyethylene PE again you have those similar names Hong Kong, Netherlands, Belgium, Canada Malaysia similar polystyrene similar names are there previously also similar names are there.

So, it basically is trying to tell you that although there are plastic waste people are worried about the exporting of it, but there are many countries that import this plastic waste fiber as well for usage different industry.

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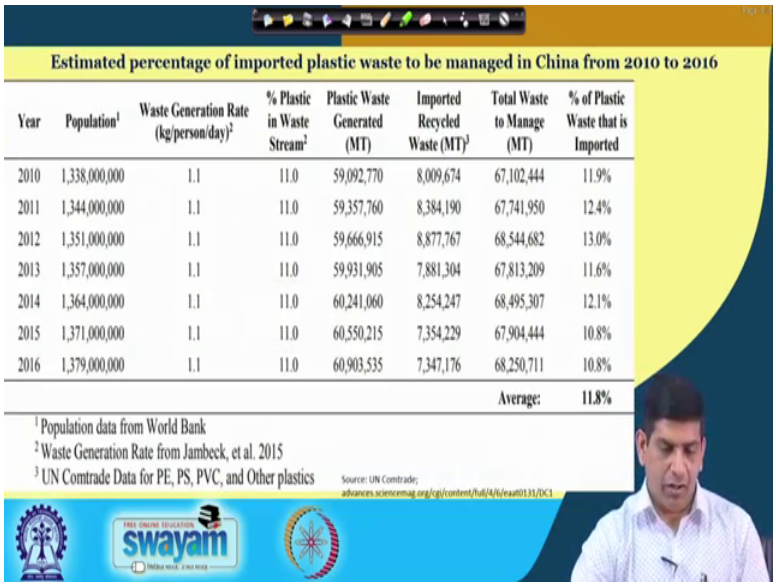

So, let us look at this last slide and then we will stop. So, if you look at a have to make an estimate of percentage of imported plastic to be managed in China from say 2010 to 2016 you look at your Waste Population, Waste Generation rate, Percentage of plastic in Waste Stream and based on that we can a plastic waste generated is this much and then based on how much plastic is getting into China. So, that is the important recycle waste.

So, we get a total recycled waste and out of that percentage of plastic was are is imported is around 12 percent. So, that is we are getting a lot of plastic waste not from within the country, but from also outside the country. So, and then with this china ban these things have got a little bit of disturbed. So, there is will be a lot of realignment going to happen it is already happening in terms of you know getting these back on track.

So, with that let us stop in this particular video. So, we will continue this discussion in the next video. So, hope you are enjoying the course so far and any question put it on the discussion forum.

Thank you and I will see you again in the next video.