United Nations Sustainable Development Goals (UN SDGs)
Professor Doctor Shiva Ji
Indian Institute of Technology, Hyderabad
SDG 12: Responsible Consumption and Production Part 2

(Refer Slide Time: 00:11)

So, welcome back. So, see some glimpses from around the world on different activities which are going in not so, happy way. So, about food wastage, what we are seeing here is the wastages of raw material, but even prepared and ready to eat food is also getting wasted at many places.

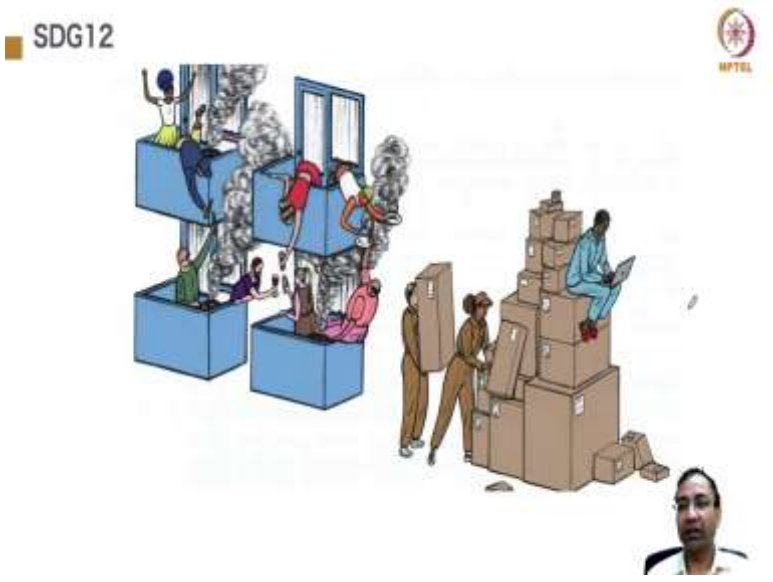
(Refer Slide Time: 00:50)

So, you are just few glimpses of the pollution, landfills, and other stuff. So, you can see the contents over here. Mostly it is either plastic or garments, everyday (())(01:09) plastic based

items, you see baskets and chairs, containers, these vessels. Even, items made up of thermocol this packaging material.

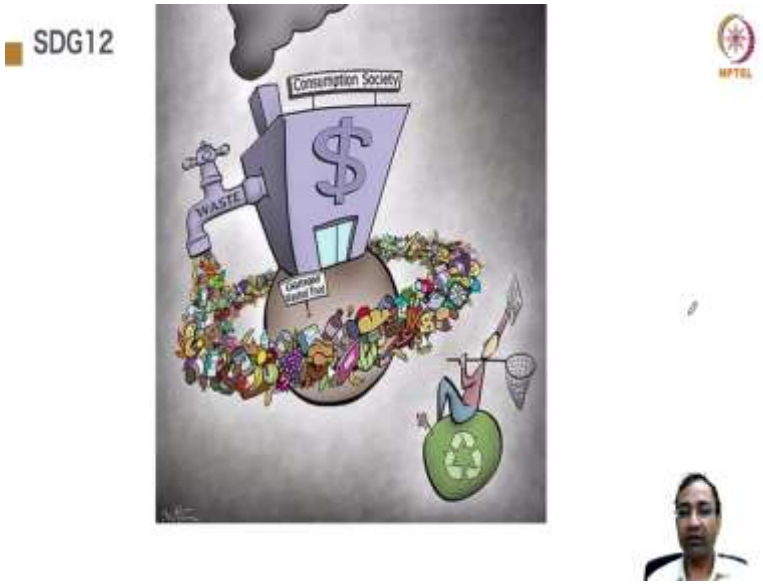
So, thermocol has also recently, evolved into a ubiquitous sort of material which is used for packaging keeps the packaged items very safe, but, it is a shelf it is usable life is really very short till it reaches the end, customer end user and after that it gets simply discarded and thrown away. And since these are casted in such a unique shape and sizes that they are unfit for any other uses also and it is not a steady strong, material it is very the form of a bubble, you may have seen it.

(Refer Slide Time: 02:12)



So, this also forms, this bulk an electronic waste, we are talking about today our society is drowning into this electronic waste. So, more visuals of how demand and supply is taking place today. Somewhere there is scarcity of resources somewhere there is so much abundance of resources that it ends up getting abused and misused.

(Refer Slide Time: 02:46)



So, very apt take on this waste generation.

(Refer Slide Time: 02:59)

Single use plastic you see this bird, she has mistakenly tried ingesting, some plastic component and now it got stuck in her neck in her throat, you see, next to the seashore, you see a lot of waste materials, which are usually kind of thrown in the see which comes back also. So, many of the places you may have seen such deposits. So, rubberized, items slippers shoes, fishing nets, plastic items and anything and everything I think this very, I think you may have seen already these images, plastic bottles.

So, according to this source, it says, plastic pollution some 4 to 12 million metric tonnes, enter oceans annually. And the majority of it actually forms a big blob and it keeps on floating and travelling, from one place to another, in a way I think acquitting animals they come in contact to this and they get impacted plus it keeps decaying even these plastic

materials you are seeing over here, it keeps decaying. It generates micro plastics, which are ingested by a small fish, and eventually, fish, this a one of the major food sources in our society.

So, it ends up supplying the same thing to the, humans on the plate. So, you can see that mentioned over here components of plastic pollution microbeads, microfibers, plastic containers discarded fishing lines and nets, plastic office tools, cell phones, cellophanes those wrapping plastic material food wrappers and straws, smoking paraphernalia and plastic bags.

Plastic becomes brittle eventually it breaks down by UV rays and sunlight and it keeps on floating which produces microfibers micro plastics et cetera. Sinking micro plastics and large debris eventually they go down also some of this actually settles down at the bottom of the ocean at the sea floor.

Microplastics make up nearly 85 percentage of the shoreline and beach plastic pollution. You see the extent of it, debris sinking to the ocean floor, toxic PCBs adhere to plastic creating sink of contaminants and microplastics plastic debris have been found in digestive tracts of animals in the deepest deep sea in trenches and other places also.

(Refer Slide Time: 06:09)

Eventually it enters into the food chain. See some of the glimpses heart wrenching pictures of how aquatic animals are coping up with this they are miserably actually falling prey to this with all such human economic activities in the name of resource exhaustion.

(Refer Slide Time: 06:35)

How these animals are getting caught in the nets and many such glimpses you may have seen it yourself and once caught they have no way to get rid of it they cannot untangle themselves you see this turtle in its early age itself got stuck in this plastic this structure and you see its whole body how it has developed and here you see that that tight this thing. So, this whole body has kind of developed into a blob. So deformed body. Mistakenly actually they end up falling prey.

(Refer Slide Time: 07:33)

You may have seen this picture there was an issue of National Geographic magazine few years back and there was an extent very lengthy extent to which they have gone and pictured these instances where these birds have ingested so many, plastic items, the small caps, debris, rings, these shells, these tubes worth not. And eventually ended up dying and this is the characters some of which is just lying somewhere and it was shot. So, it is a definitely it can be called as plague of plastic actually this whole plastic thing is plaguing, the whole this planet.

(Refer Slide Time: 08:28)

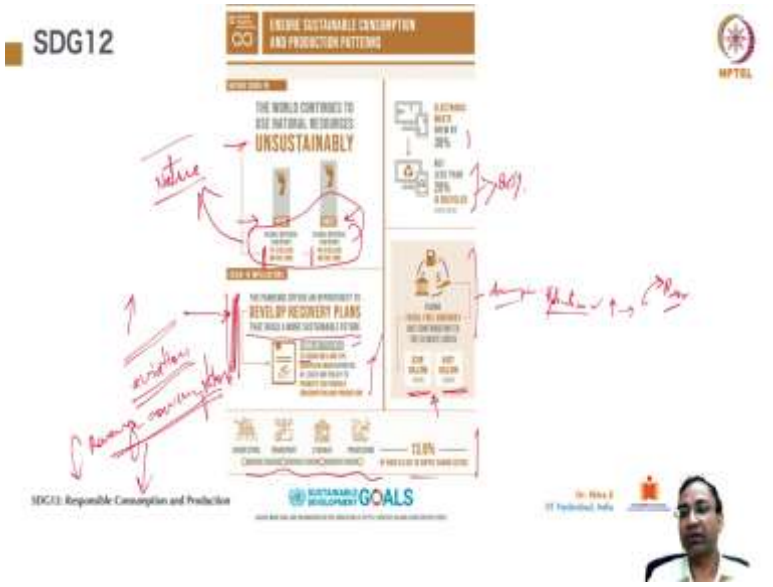
Another heart wrenching image of this, this turquoise getting, it has mistakenly it has I do not know this, straw this humble, straws we use, for juices and drinks, in its nostril one of its

nostril is got stuck. And yeah, these rescuers actually rescued him. I think this is available over internet, maybe you can try watching that YouTube video, you will see the extent of misery, this material has brought to the other animals.

(Refer Slide Time: 09:10)

This cartoon is a little older, I think we have recently reached population or 8 billion. So, it is a moment, for celebration, but if you see so many, 8 billion mouths to feed, definitely, I think Earth is in a severe scarcity of providing, these resources. So very apt presentation.

(Refer Slide Time: 09:39)



So, if you see some facts and figures, related to this mindless consumerism. The world continues to use natural resources, unsustainably. 2010 this footprint was global material footprint 73.2 billion metric tonnes which raise to 85.9 billion metric tonnes in 2017. So, that

is indirectly all of this is coming from, nature whether it is human grown or naturally occurring, but it is a resource, which belongs to the planet.

COVID-19 implications on this, the pandemic offers an opportunity to develop recovery plans, because, many of the activities, industrial activities, official activities and things were, came to halt, or they were stopped, that was kind of recovery, time recovery phase for the planet.

But, after markets, open everything open actually things are going back to the normalcy and again, we are back to consumption. And in some sectors, there is a revenge consumption in aviation recently I was yesterday itself, I was reading a report and that number of fliers, per year, so, during, in the last year, there is a huge spike in the number of fliers who are flying from one place to another.

Compared to the previous years before pandemic because many people now want to go out and see places roam around this and that because after a gap of 2, 3 years, now, this phase has come after pandemic. So, now that revenge consumption is also happening at this time, which will again, push and all of these breathing whatever breathing time the planet has found for little a few months, I will again, I think lead to a higher rate of consumptions.

The pandemic offers an opportunity to develop recovery plans that build a more sustainable future from 17 to 19 79 countries and the European Union reported at least one policy to promote sustainable consumption and production. 79 countries. so, that is the number. Electronic waste grew by 38 percent but less than 20 percent is recycled that means over 80 percent is not recycled, rising fossil fuel subsidies are contributing to the climate crisis, cheaper the prices of hydrocarbons more motivated, the people or more less they care for spending it.

So, is one of the indirect ways to control like, hydrocarbons is that you raise the prices. Well, that is not favourable in the case of low developing countries or developing countries because most of the economic activities are driven by hydrocarbons as of today. So, our economy is driven by this thing, and if this gets price here, the price of other commodities and supplies and materials also gets costlier.

So, this has repercussion on other, sides that it gets directly impacts to the poor people. Rich people it may not be much of a difference, but for poor, it definitely it matters and it adds to the overall costing of anything and everything. So, in this one subsidy 381 billion dollars in

2015 to 427 billion dollars in 2018. And 13.8 percent close to 14 percent of food gets, lost in all of these stages, harvesting, transport, storage and processing.

(Refer Slide Time: 13:45)

So, what are the goals and targets over here inside this SDG. Implement the 10 year framework of programmes on sustainable consumption and production by 2030, half per capita food waste at the retail and consumer level. At least half reduce the, waste by half by 2030. So that that 14 percent figure, can come down to even lesser or even lesser perhaps one day, we will be able to reach to the zero-food wastage.

Promote sustainable public procurement practices. By 2030 ensure that people everywhere have the relevant information and awareness about sustainable development, because many of the people are not even aware of such issues. But 2030 achieved the sustainable management and efficient use of natural resources and preserving them for tomorrow.

Like remember the Brundtland Commission's report. The report mentions that we must preserve these resources for future generations also. Encourage companies especially large and transnational companies to adopt sustainable practices support developing countries to move toward more sustainable pattern of production and consumption.

By 2020 achieve the environmentally sound management of chemicals and all waste throughout the lifecycle by 2030 substantially reduce waste generation through prevention reduction, cycling and reuse. Develop and implement tools to monitor sustainable development impacts for sustainable tourism.

So, tourism also has impact and mostly it comes from because tourism is supported by another industry aviation industry and hotels, restaurants and other forms of, transportations, surface transportation, water transportation et cetera. Which are actually trying to woo customers or create a, once in a lifetime experiences and all of those things. In turn, they end up creating huge impacts.

So, if we go above around tourism sector, we can definitely make it sustainable for everyone that it does not stops also, it does not creates negative, an impact, racialized, inefficient fossil fuel subsidies that encourage wasteful consumption. So, wasteful consumption of any resource and mandatorily for hydrocarbons must stop, but yes, the responsible consumption should also be promoted at the same time. Because increasing cost or removing subsidies is definitely going to hurt poor the most. For more details, you can refer this link.

(Refer Slide Time: 16:46)

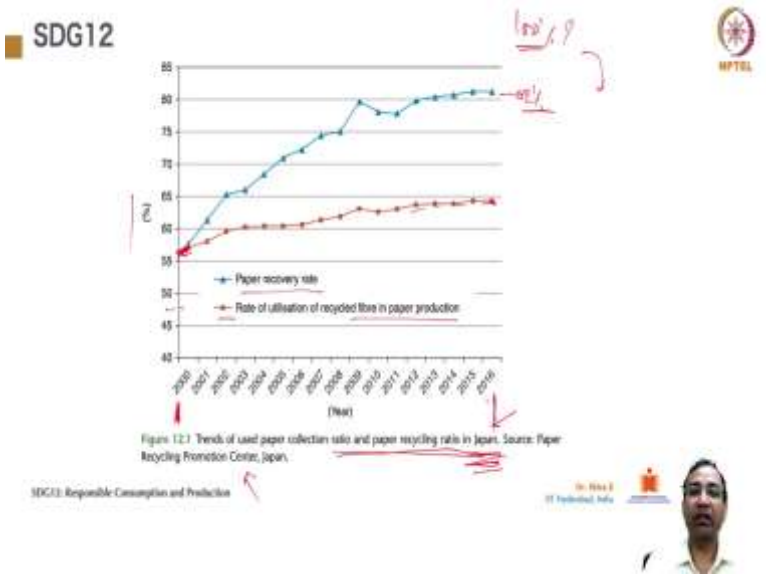
So, some targets if we see, inside this SDG. Implement the 10 year framework or programmes on sustainable consumption and production patterns, all countries taking action with developed countries taking the lead taking into account the development and capabilities of developing countries by 2030 achieved the sustainable management and efficient use of natural resources.

By 2030, half per capita global food waste at retail and consumer level by 2020 achieved environmentally sound management of chemicals and always throughout their lifecycle in accordance with agreed international frameworks and significantly reduce the release to air water and soil in order to minimise the adverse impacts on human health and the environment.

By 2030 substantially reduce waste generation through prevention, reduction, recycling and reuse. Encourage companies especially large and transmission companies to adopt sustainable practices and to integrate sustainability information into the reporting cycle. So that, they can also plan their functioning, in compliance to the sustainability practices.

Promote public procurement practices that are sustainable in accordance with national policies. By 2030 ensure that people everywhere have the relevant information and awareness of sustainable development. Support development countries to strengthen their scientific and technological capacity to move towards more sustainable pattern. Develop and implement tools to monitor sustainable development impacts, rationalising efficient fossil fuel subsidies lastly.

(Refer Slide Time: 18:17)



So, in this one, well, this is from Japan source from paper recycling promotion centre, Japan that trend of use paper collection ratio and paper recycling ratio in Japan. I think one of the most, I think discipline self-discipline country, I think where public in general is very responsible and takes care of their behaviour in the public. So, there if we see the rate of utilisation of recycled fibre in paper production, it is increasing, from less than 50. Now, it is, little around 55 it is going to reaching, 65 percentage and people recovery rate, if you see that is increasing even more, from the same rate of around 57, now it is at the rate of above 80 82 looks 82 percent 82 83 percent. So, in that range.

But just imagine one hindsight of this slide is if a society Japan, where so much of just self-discipline and governance is there very efficient, if they have also not reached to, this level of

100 percent, just imagine the condition of him other countries and other places. But yes, it is very good this thing to see there is tremendous consciousness and control, which has come between in 2002 to 2016 during this period this has risen so much.

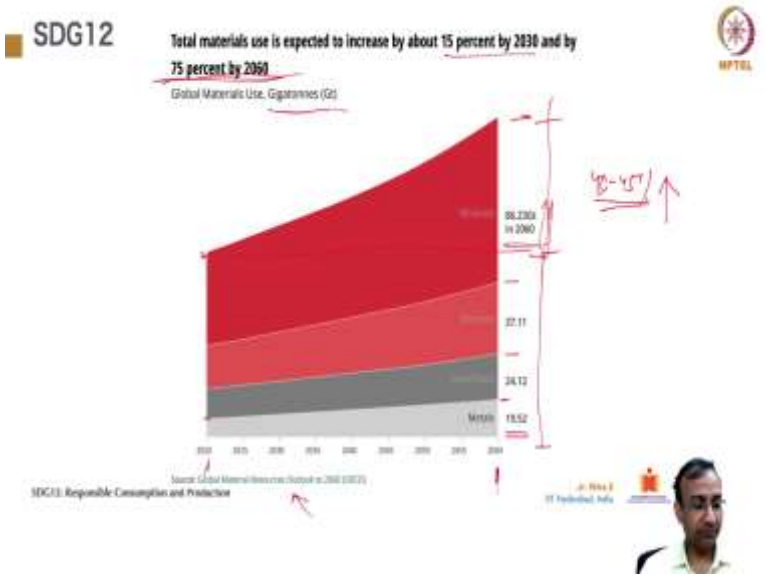
(Refer Slide Time: 20:04)

Targets we have seen.

(Refer Slide Time: 20:09)

So, now managing waste. So, in waste also there are different categories. So, electronic waste, E-waste we discussed then food wastage and other organic wastage material than other solid and different kinds of waste paper, plastics and et cetera.

(Refer Slide Time: 20:32)



So, total material is used and expected to increase by about 15 percent by 2030 that much of a percentage growth we are targeting and by 75 percent by 2060. So, that is a tremendous growth during this period you can see the source, for the latest data. It talks about in Giga tonnes. So, for metals from 2020 to 2060, it is expected that it is going to grow at 19.52 giga tonnes fossil fuels 24.12 giga tonnes, biomass 37.11 giga tonnes and minerals majorly 86.23

giga tonnes. So, that is an extent we are looking at from this it is going to this, so, range wise if you see is almost 40, 45 percent range increase.

(Refer Slide Time: 21:45)

Food waste and plastics together make up more than half of global waste. So, the share of global waste if you see, so, food and green waste constitutes the highest at 44 percent. So, the first picture you saw whether it is a raw food item or maybe a processed or cooked food item it is getting waste by an extent of 40 percent.

And how much is that of total waste generated across the world is 44 percent close to half. Then second one comes of paper and cardboard at 17 percent. Third one is of plastics because another interesting point here the food and the green when waste generated, but since food itself is a process and organic material.

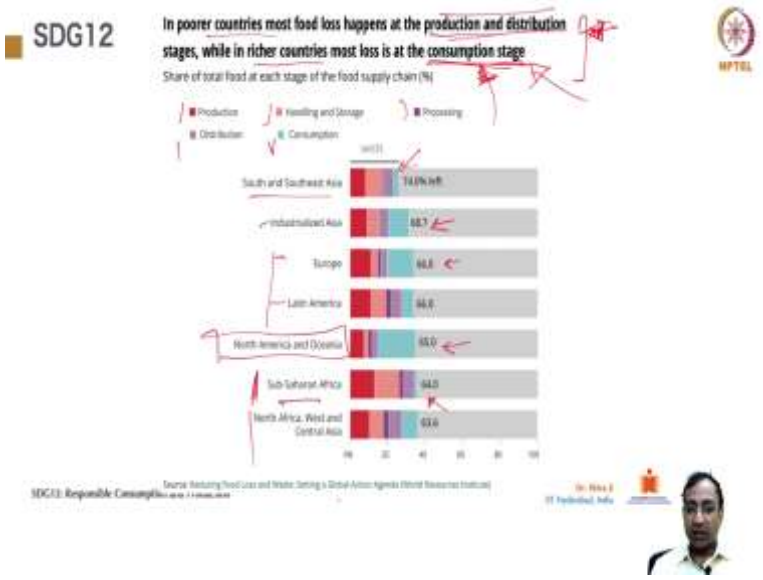
Even if it is thrown here and there after a while in few months and some time. It decays decomposer and goes back to the raw nature in its elemental form. But other things, paper, cardboard and majorly plastics and they are not, so easily biodegradable.

So, the problem is all of this, whatever even if it is at 12 percent of the total, global waste, but this waste actually is there for a long long period of time. So, the compared to life of any living being us, average age around 80 86. So, compared to that, the age of plastic material once it is produced is in 100 and 1000s of years.

So, the compared to the, if you see the time, we used it and the time is going to be there in the system, if you take, this ratio, this capital T is much, much larger and bigger, compared to the small t it is actual usable time actual usable period. So, that is where the problem is. Then

next to that we have glass 5 percent, metals at 4 percent, then rubber, leather, wood et cetera. And then finally, other mix kind of materials.

(Refer Slide Time: 24:12)



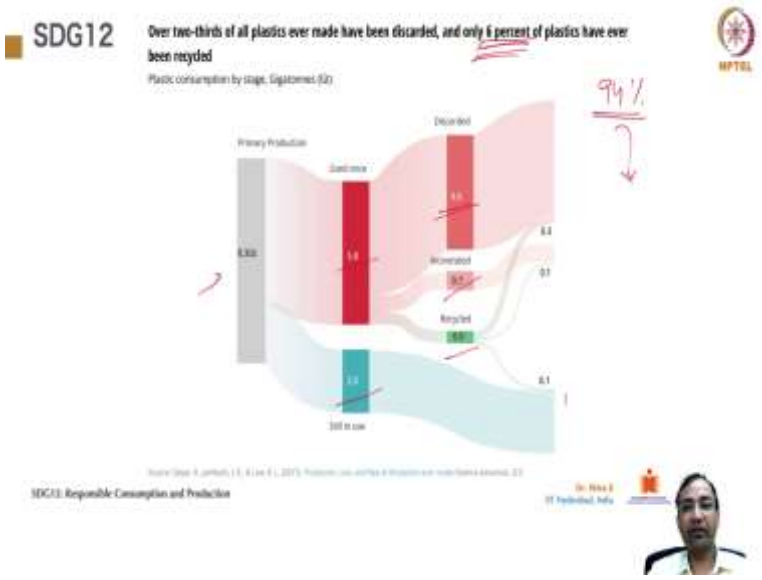
In poorer countries, most food loss happens at the production and distribution stages, while in richer countries most loss is at the consumption stage. So, it is a very kind of paradoxical intellect situation. So, well of course, the poorer countries are not so good and sometimes they find it hard to meet the demands in the food. But still, they there also they have problems in the efficiency of production and distribution, there is a of food wastage.

And in richer countries, if it is efficient, if this production and distribution is efficient, then the problem is at the consumption stage, because the people in general from richer countries they have a higher purchasing power. And there is huge abundance of resources and supplies. So, they do not care so much. They are not that serious about saving food items and that is why there is a largest share of food wastages at consumption stage, this shares you can see over here add production, handling storage, processing, distribution and consumption.

So, you can see in South and Southeast Asia the wastage at consumption level is very small, the most minimum wastage at consumption level is in Sub-Saharan Africa and highest wastage at consumption level is in North America and Oceania US, Canada and Oceania countries, that group of countries then second most wastage happens at the consumption stages is in the Europe and then third in industrialised Asia Japan, Korea's, China these places. And the largest wastage production stage is in Sub Saharan Africa second largest perhaps in Latin America and Europe. And then we have North America West and Central

Asia and industrialization. So, there is this distribution. You can refer, World Resources Institute for latest data.

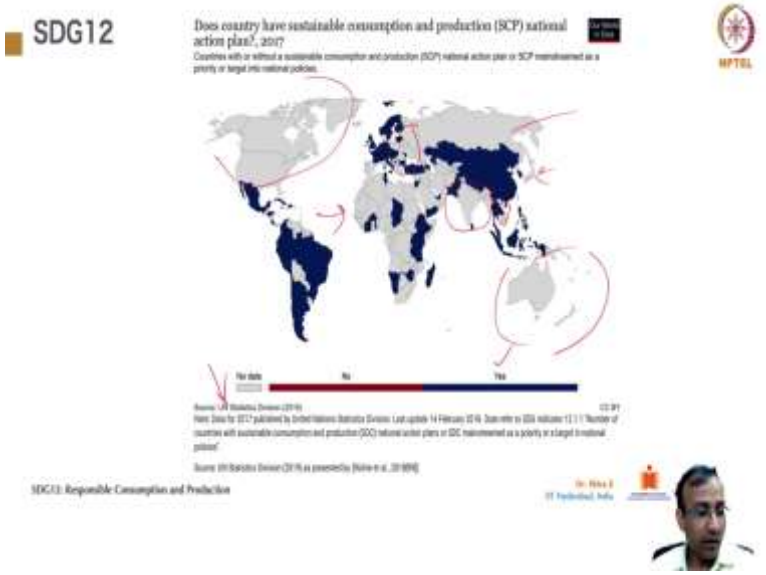
(Refer Slide Time: 26:36)



Over two thirds of all plastics ever made have been discarded only 6 percent of plastics have ever been recycled. So, only 6 percent of plastics have you ever been recycled that means whatever plastic is produced till now, the whole world only 6 percent is recycled 94 percent is not recycled and maybe lying somewhere in the ecosystem.

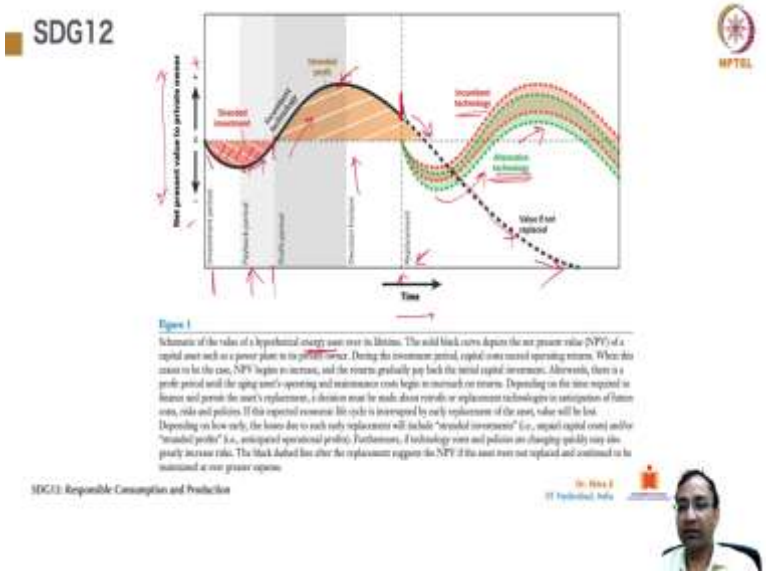
So, this is this situation. Primary production plastic consumption by stages if you see 8.3 giga tonnes use ones 5.8 trillion still in use 2.5 out of this 4.6 giga tonnes actually gets discarded and only small 0.7 gets in incineration for power generation et cetera for recycling only 0.5 percent. So, this is the extent.

(Refer Slide Time: 27:40)



Some data on does country have sustainable consumption and production national action plan 2017. So, you can see as for 2017 from the source UN statistics division, there is no data available from many of the countries in the North America it is empty many in the Eastern Europe it is empty, Russia empty, South Asia I think (())(28:08) many countries here. And Australia, New Zealand, this portion is empty, Japan, there is no data and most of African nations also there is no data. And in Yes, of course, I see a number of blue countries.

(Refer Slide Time: 28:32)



In this one, we will see schematic of the value of hypothetical energy asset over its lifetime. So, how like, energy asset actually gets consumed and exhausted. So, that thing we will see. So, here on the left hand we have net present value to private the owner in this side in plus

and this side in minus. So, investment period it starts going down and this whole thing is the investment payback time begins from here that starts going in the upward direction and here it meets the breakeven, then we go into the profit period.

So, and in between decision horizon also comes where you need to take number of calls, how to safeguard and bring it back to the up way upside down trajectory, but gradually it goes in the declination, and there is a time which comes which asked for replacement of technology or system or you know, entities which may lead to again bouncing it back that it will go up in the alternative technology domain. Incumbent technology, if you see, so, that may also take a leap after replacement. But if it is not replaced, the value is constantly going to decline in negative causing a lot of issues. So, this is the timescale.

(Refer Slide Time: 30:13)

Then inter connections and interactions, that is given and that is shown over here in with the red arrows. So, here it is happening at behavioural lock-in, technological lock-in, and institutional lock-in, what can be done. So, for national institutions, they can debate and decide and frame similar rules and regulations, local institutions will be mostly actually executing it taking care of it and user technologies, these are the technological locking period, we are supporting infrastructure and user the two main segments and then with the behavioural lock-in, we have individual behaviour, we have cultural and social practices representing the community.

And there is interaction between these, from one to another, you can see the picture interconnections and interactions amount and within different levels of carbon lock-in, carbon lock-in occurs in multiple dimensions institutional technological behavioural at multiple

scales local to national or individual to structural with multi directional causation between and among the levels.

For example, governments can influence technology through regulations and legal frameworks, but technology also influences government decision making through activities such as lobbying and political donations. The red arrows demonstrate the multi directional causation between and among the levels of lock-in and are intended to be illustrate only.

(Refer Slide Time: 31:49)

So, ensure sustainable consumption and production pattern. So, it aims to promote responsible sustainable consumption as well as production systems also well, how is it cultural relevant in this case, local traditional products that are suited to sustainable consumption production need to be recognised and appreciated.

So, not everything which is manufactured or made in factory is only good I think the goods which are made by hand made by some community at someplace also can be equally good. What can cities do? Include history and culture, recognise gastronomy based on local produce, and promote local cuisine culture, facilitate more citizen initiatives, how cities make this effective some examples you can refer you can search for these, in more detail, you will get to see interesting case studies.

So, here one of the cities that promoted Chefchaven I do not know whether I am pronouncing the name correctly, that promoted the recognition of the Mediterranean diet as an element in UNESCO's Intangible Cultural Heritage list. Local policies highlight the importance of the culinary arts, helping citizens come in terms with their identity strengthening inclusive

economic development et cetera. In the Florianopolis in this context of his municipal culture plan, the city has adopted measures to foster a reinterpretation of traditional cuisine.

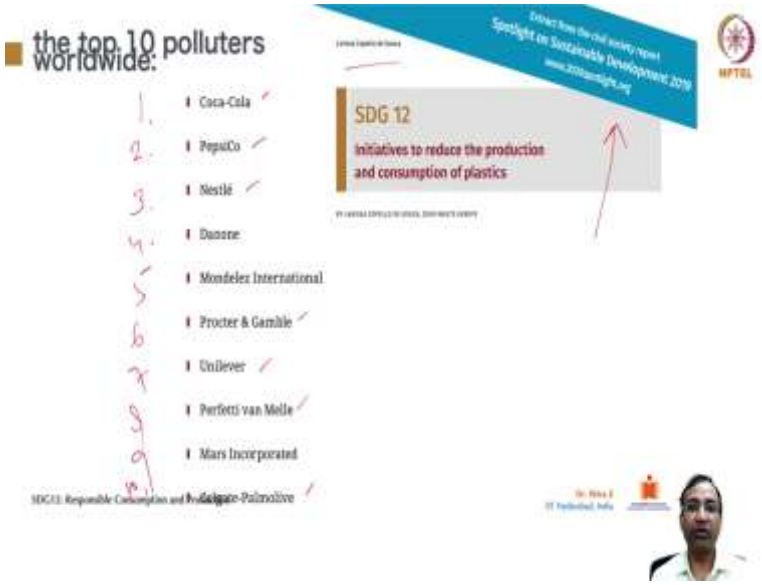
The Sunday culture fair of La Paz aims to democratise access to locally produced cultural expressions and events. The MUSEM culinary Centre in Gaziantep contributes to keeping local gastronomy alive understanding it as part of intangible heritage. So such (())(33:46) can be taken up in every country.

(Refer Slide Time: 33:50)

So, as an individual what can we do minimise first of all our consumption, reusing recycling must be promoted by all of us. Be responsible for (())(34:03) disposal you know one not litter here and there or throw on the even on the land also because from land it has potential that it can reach to the oceans.

While single use plastics and utensils must be avoided, plastic bags must be avoided excessive packaging also reached or should be reduced and promoting recycled products, cloths made from natural fibres, so, that they can (())(34:34) decompose at the end of their lifecycle, otherwise synthetic fibres and yarns they are not so, easy to recycle and make use of another (())(34:46) use. Outdoors take trash with you and plus they do not decompose naturally also, they take a long long time several 100 and 1000s of years in some cases. Outdoors, take the trash with you support environmental initiatives.

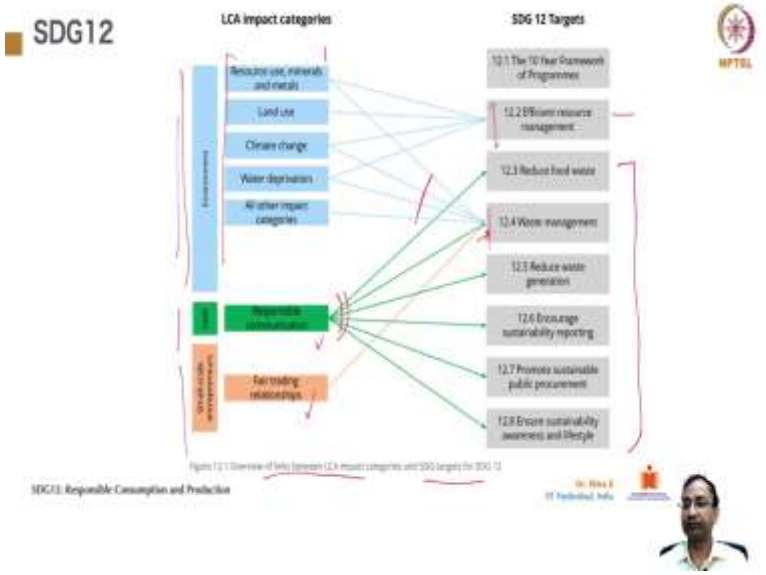
(Refer Slide Time: 35:00)



So, you may be wondering who are these polluting elements. As a consumer I think every person who is consuming things and resources with an irresponsible sense is the offender of this planet and the whole this life system which is existing on this planet. But some of the most polluting company is worldwide as identified by this source if you see you can visit this website and see for latest data.

So, they have named, Coca-Cola these beverages company as the first one, PepsiCo as the second, Nestle this very famous company this is third polluting company in the whole world. For fourth we have the Danone then Mondelez then P and G, Procter and Gamble, Unilever, then Perfetti, Van Melle, Mars Incorporated and Colgate Palmolive. So, many of these companies, we are also aware of. So, we all can relate and we all may have used some products from these companies. So, in a way all of us also contribute to this mess.

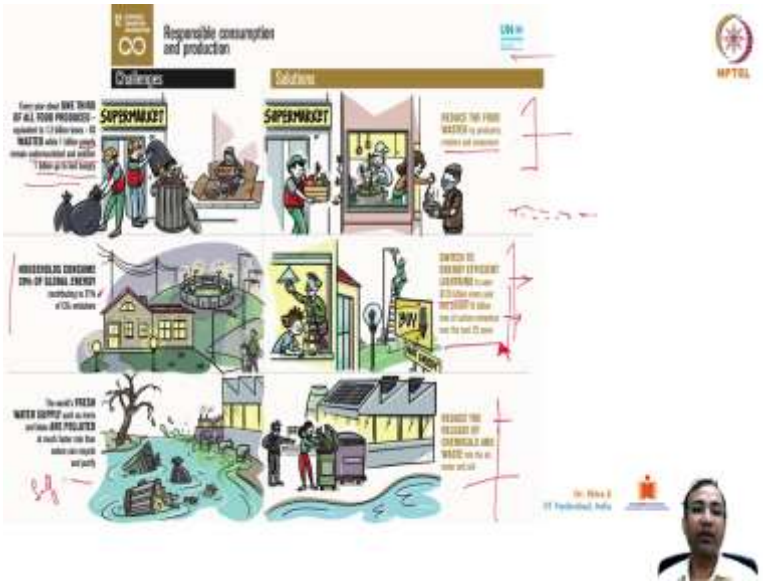
(Refer Slide Time: 36:26)



Here is the overview of links between LCA impact categories and SDG 12 targets inside of this. So, you can see this is this belongs to environmental set user sets, small scale enterprise set, what are these resource use mineral and metals land use climate change, water deprivation and all other impact categories. Responsible communication here, unfair trading relationship is given over here.

So, from bottom if I see this fair trading relationship directly talks about waste management that target 12.4 and a responsible communication there are all of these you know at the bottom, these 6 reduce food waste, waste management, reduce waste generation, encourage sustainable reporting promotes sustainable public procurement, ensure sustainable awareness and lifestyle 6 and here are the top if you see environmental impact categories, so, resource use mineral metal land use cc water deprovision (())(37:30) impact categories. So, first four of them actually are connected here, 12.2 efficient resources and the remaining these four are connected to again waste management target 12.4.

(Refer Slide Time: 37:48)



So, we have come to the this last slide, in this we have challenges and solutions given from a UN Environment. So, every year one third of all food produced equivalent to 1.3 billion tonnes is wasted while 1 billion people remain undernourished and another 1 billion go to bed you know hungry, stomach, what can be done reduce food wastage, by producers, retailers, consumers at all stages is often the journey of food, it must be saved, households consume 29 percent of global energy contributing to 21 percent of Co2 emissions.

So, almost 30 percent you know, so switching to efficient, lighting solutions or other electricity consuming devices to make them efficient. So to say, 120 billion dollars every year and provide 16 billion tonnes of carbon emissions over the next 25 years you see the extent by saving that much how much of Co2 emissions will be saving.

The world's freshwater supplies such as rivers and lakes are polluted at much faster rate than nature can recycle and purify. So self-healing capacity we discussed earlier. So, that is, getting outpaced by the rate at which pollution is happening. So, reduced release of chemicals and waste into the air water and soil.

So, in a nutshell, I think the idea is that to save on overconsumption. So, now, this lecture is done, this module is over, and I would definitely request from all of you who must take this lesson and inform your family members, your friends, peers, and everyone to be very cautious about conjunction patterns, our consumption patterns. Because all of us carry equal share in this responsibility to save our planet. So, with this, that we have come to the end of this module. Thank you all for joining. See you in the next one.