United Nations Sustainable Development Goals (UN SDGs)
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SDG : 11
Sustainable Cities and Communities Part II

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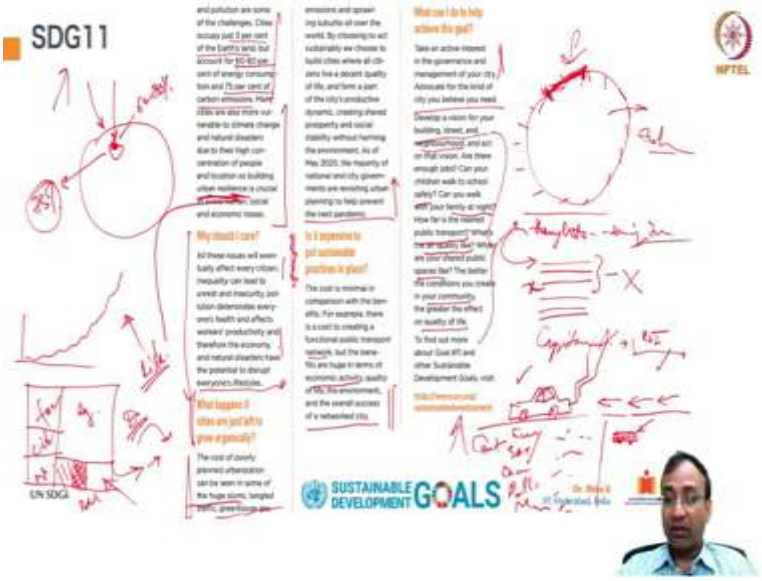

So, moving on, cities occupy just 3 percent of Earth's land, you see these lands, but account for 60 to 80 percent of energy consumption and 75 percent of carbon emissions. Many cities are also more vulnerable to climate change and natural disasters due to their high concentration of people and location. So, building urban resilience is crucial to avoid human social and economic losses. So, if you see these stats only 3 percent of whole worlds land area is occupied by cities in total, but 60 to 80 percent energy consumption is taken by these cities and 75 percent they contribute to the emissions.

That is a statistic, and it is very concentrated form of a consumer, you can call cities are such a big consumer and emitters of course 3/4 of the total emission, comes from the cities, many cities. And this is where, it becomes essential because, the density is very high you see 3 percent of the total land surface Earth's land and huge percentage of population well, it varies, from every country to country, but that is increasing, that is the trend all of the places and everywhere, I think cities, population is gradually, increasing, and that puts big risk because, so, wherever there is a risk, there should be resilience, that thing.

So, that is what needs to be done with SDG 11, why should I care? Well, we are also part of it this whole system and or somewhere, ourselves or our family, our friends or relatives or our colleagues, they are in the cities. And for other reasons also, since, urban and rural, it is just divided for its functioning otherwise, they are in human habitation and supplies resources, a lot of things are getting exchanged, from every part to the other part. That is why it is essential all these issues will eventually affect every citizen.

Inequality can lead to unrest and insecurity, pollution deteriorates everyone's health and affects workers productivity and therefore the economy. The natural disasters have the potential to disrupt everyone's lifestyle. And if you see natural disasters, well, they can impact everybody's and anybody's life, irrespective of whether you are directly impacted or not, if some place or some region of your country is impacted, you feel that the other type of effects and consequences in the coming months.

What happens if cities are just left to grow organically randomly on the way they know they are growing, without regulation without any control or checks, the cost of poorly planned urbanization can be seen in some of the huge slumps, this is how it will happen if you just leave it that, tangled traffic, greenhouse gas emissions and sprawling suburbs all over the world by choosing to act substance sustainably, we choose to build cities were all citizens and live in a decent quality of life and form a part of the city's productive dynamic creating shared prosperity and social stability without harming the environment.

As of May 2020, the majority of the national and city governments are revisiting urban planning to help prevent the next pandemic. So, various regions are there and why, we need a control growth, even in the villages also if you see if it is not controlled or if it is not regulated by you some rules regulation and by laws. The development the building of houses or building of any manufacturing unit any factory anything, can happen anywhere.

So, that will be a very totally mindless kind of situation, because any if you are given with some resources land is a precious resource and so, this must be divided, based on the proportion of the things which are needed, for agriculture, for forest, for cities, urban habitations, for manufacturing industries and all of those things, public administration, even roads are also overall if, they also take our major surface area of our planet, so roads, and many other things,

and then the free, like, swaths of land where other wild animals and wild species of flora also can survive. So, we cannot capture the whole world and or we cannot pave if the entire planet surface for human habitation is going to kill it.

So, it definitely requires a check and measurement, so, that how much is sustainable how much of this can be occupied or can be taken for in some particular purpose to maintain that type ecological balance and all of those things. Is it expensive to put sustainable practices in place and that is myth, that sustainable things are actually costly. Well, if you put in your thoughts and planning, in your drawing board stage, that means initial stages of your planning and estimation, definitely, you can optimize and minimize the overall costing, you can bring it down.

And overall, it helps in efficiency also the kind of output you are expecting, from x input. So, that you can maximize and bring it to the economical aspects also. So, green things are not necessarily costly always well, they may be if you are investing as a kind of capital investment or things that. So, it may be a little pricier but the returns what you are going to get, on or your investments, ROI. So, in that also you can manage it.

So, there may be multiple ways, how you can economize on the investment, let me read this. The cost is minimal in comparison with the benefits for example, there is a cost to creating a functional public transport network, like, mass rapid transit, transportation systems or railways, it was bus all of it, but the benefits are huge in terms of economic activity, quality of life in environment and overall success of a network city.

So, if you see everywhere if you everybody starts in driving a car, and all the public for city, start riding in. So, how much of surface area of road will be needed, how much of parking spaces are needed, how much of emissions and all of these vehicles are going to generate and all of that, so, per person per capita, what will be the overall cost, cost to the environment, cost to the society, cost to the, economics, pollution, emissions, manufacturing, energy investments, all of those if you compare it will be huge, huge, huge.

So, like, we know, it is a proven fact, for example, 20, 30 group of people if they want to travel. So, buses are still the most economical, not just on cost, but on environmental factors also, so, why not to invest in a transportation infrastructure for the whole city and save on the personal

vehicles, that is why promotion of metros and local railways, buses, city buses and everything is promoted, what can I do to help achieve this goal as an individual.

So, take an active interest in the governance and management of your city, maybe based on your, like, expertise, area, subject knowledge, or wherever you are in whatever position, you can engage yourself, into any of such activities, a total advocate for the kind of city you believe you need, develop a vision for building, street and neighborhood and act on that vision. Are there enough jobs? Can your children walk to school safely? Can you walk with your family at night, on the street? How far is the nearest public transport from your place? What is the air quality like? What are your shared public spaces like? the better conditions you create in your community, the greater the effect on your quality of life.

So all of these questions if you see, they are applicable to all of us, nobody can say that you are not going to, use your street or the road, you are not going to, avail for public transportation your family members are not going to go to the market or education or hospital, all of these things, if you see are part of our everyday life, irrespective our place even in the rural areas, even in the towns, villages, cities and everywhere.

So, all of these questions, definitely, maybe some of these questions will be aligned to your interests or your needs, maybe you can, start pursuing, these and start questioning the local management, local administration and start bringing change, by yourself. So, more details here.

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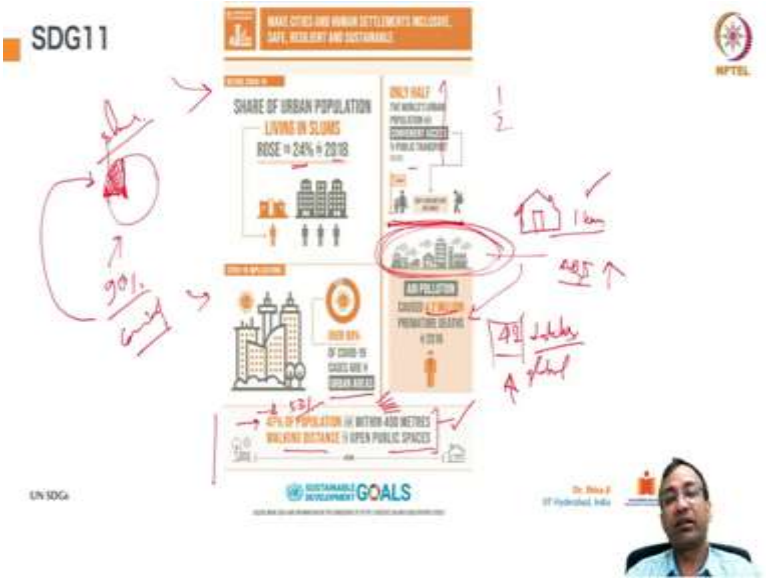

Some facts and figures before COVID-19 share of urban population living in slums rose to 24 percent in 2018, 24 percent, in almost 1 quarter, slums of urban population. So, if this is a city almost 24 percent before pandemic was living in the slum area, just imagine 1/4th, well COVID-19 implications if you see over 90 percent of COVID-19 cases are in urban areas.

So, out of this 100 percent 90 percent of it was affected because of COVID and in that two also maybe this pent, densely packed region, these 24 percent was perhaps the biggest contracting place, single this thing if you see, we saw in the previous slides, only half the world's urban population has convenient access to public transport as per 2019 only half 500 to 1000 meters distance.

So, this is the public convenience, we are talking about from your place of living, this should be in the vicinity of like, a 1 kilometer, then you can say, this is a convenient access for you, that you can walk cycle or take an auto rickshaw something that, air pollution caused 4.2 million premature deaths in 2016, that is 42 lakhs, we are talking about, of course, this, these figures are global flickers, but still, out of this, if you see the most polluted cities of the world, I think several of them, will come from our country.

So, I am sure a pretty high percentage of this, will be from our country or from South Asian region. So, this is an eye opener how an Air Quality Index, of, like, these urban areas can be

improved. 47 percent of population live within 400 meters, walking distance to open public spaces, so that is a very good feature at least 47 percent of people, they have some open space maybe, parks, and gardens and open spaces, in a walking distance length but remaining yet to be go on, 53 percent are yet to get that and that means they are in beyond 400 meters distance.

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So let us see some targets, by 2030 ensure access for all to adequate safe and affordable housing. So everybody gets a house because you may have seen a lot of buildings, flats and apartments coming up in the cities, but still a huge population lives on rent, or they are unable to find even a nice, decent rented accommodation, and that is how they will end up in the slum areas. So, if this is the taken care of slums will definitely reduce. So, there is a direct correlation, affordable housing and a decent housing place by 2030 reduce the number of deaths and people affected, to economic losses caused by disasters.

By 2030 provide access to safe affordable, accessible and sustainable transport system for everyone support positive economic, social and environmental links between urban pre-urban rural areas, by 2030 it will reduce the average per capita environmental impact of cities, this is a very important part, by 2020 increase the number of cities adopting the Sendai framework for disaster risk reduction. So, maybe you can search for it separately, Sendai framework for DRR disaster risk reduction, you will get a comprehensive document, which talks about what should

be doing measures checks policy action plans, for, like, making cities and resilient to place, for facing any eventual, natural or manmade disaster because, sometimes you cannot predict.

Well, some of these things are predictable, like, if a city is particularly located in, earthquake zone 5 for example. So, obviously, beforehand this is a, very high risk zone. So, how the design of buildings or structures, streets, roads are going to be like, you can work for that, open spaces, refuge areas and all of those things. But some of the some of the things, cannot be predicted, for example, tsunamis and stuff and all, there once in a blue moon, they occur after several decades and years.

But yes, whenever they occur, the amount of, like, the magnitude of damages is really big, so we need, comprehensive resilience plans and that you get from this document so Sendai framework for DRR you should search for it separately. By 2030 Enhance inclusive and sustainable urbanization and capacity for participation integrated and sustainable human settlements.

Strengthen efforts to protect and safeguard the world's cultural and natural heritage. By 2030 provide universal access to safe inclusive accessible green and public spaces, universal access. Support least developed countries in building sustainable and resilient buildings with local materials.

So, well with the local materials and then another very interesting chapter opens up I have discussed in my another NPTEL course, strategies for sustainable design what is a sustainable design in that, like, there are one of the recommendations that if you are sourcing some material, from beyond radius of 500 kilometers, the indirect emissions, which are going to happen, for its transportation and other stuff is going to be higher, perhaps some more than then or manufacturing itself.

So, that is the additional burden you are creating on the ecosystem. So, to save on that most of the materials, should be sourced from the radius of 500 kilometers, that will make it another sustainable that is why, like, it is mentioning the local materials, the local materials carry, another unique feature that they are part of that geography that climate. So, they are in a better capacity to respond to the extreme of that climate for example, too hot if it gets you can use a

local materials often thatch mud etcetera, to improve on the overall energy efficiency of your building. And similarly, there could be multiple such examples.

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So, very common site of city's if you see in this image, this road network, is elevated to give a signal free and fast transportation moon in the city, but if you see these are in houses, residential areas, again apartments over here, again, apartments living the houses over here, it looks an offices and corporate are in this sector in this area perhaps. So, there may be lot of noise pollution, from this place, air pollution of course. And, it is eating so much of space, if you see they have derived park at the ground floor over here.

And these bridges are elevated. So, at least some land is reclaimed over here, one can go and take a walk in this area, but still, like, there may be chances of air and noise pollution from this highway since it is passing, usually from this residential neighborhood. But yes, at least, something is better some in points are better that now, this traffic is not running on the ground surface because, it will kind of interpret that much of space plus it will be difficult for people at living in this area to commute because if it is a long distance and travel long distance route, then person, from faraway places, if they want to travel to another faraway places, they can, pass quickly and smoothly. So, multiple such interventions.

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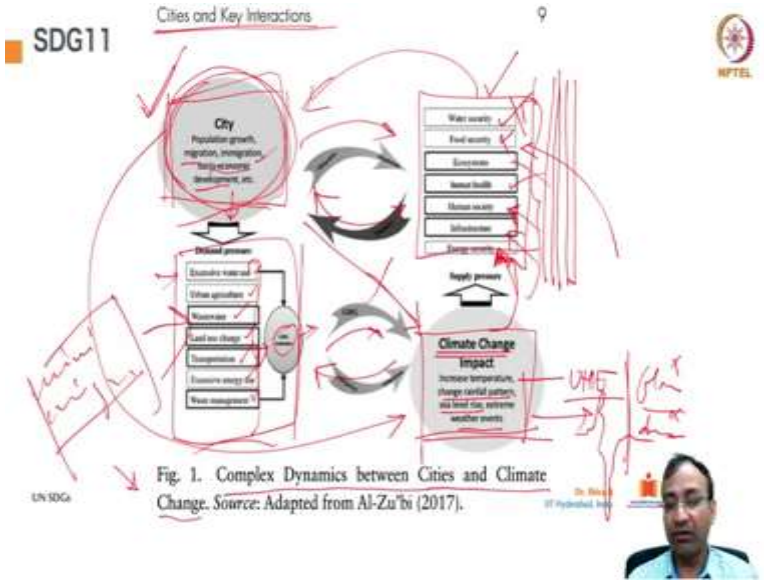

Let us see, so, at the city level, what do you think are the key interactions, in the city itself. So, you can see from this source, well, a city has population and populations growth, if there is population, so, most of the places, population is increasing. Then city has like, there may be some reasons, which might cause an on migration, there may be some benefits that people will be landing in there, that is immigration. And other social economy development and its own culture and then things.

So, as a whole, it puts up a demand pressure, what are those demand pressure? Water uses since it is a concentrated very dense population, so concentrated water use, urban agriculture, wastewater, land use change, from maybe a flatland to now it is a highly dense populated land, transportation, excessive energy uses, because of, like, now cities are running on the road electricity 24 hour even if you take out electricity for five minutes, most of the things are going to get a hard line railways will stop, metro will stop, and healthcare facilities will stop, lifts will start stop working and things that.

So, we are so much dependent on energy and in that also uninterrupted energy supply, if there is interruption, there is not some issue is going to happen, And waste management, etcetera, etcetera and all of these are causing some sort of impact, one of those impacts is GHG emission and many other types of impact. So, if you take just in GHG is over here. That is a major

contributor to the climate change. So, that is what we are discussing is cities are definitely, directly causing you climate change impact.

So, increase in temperature initially we discussed UHIE, urban heat island effect, then change in rainfall patterns. So, you may have observed I think the most of the places now, they are we experiencing abrupt changes in the pattern of weather and climate whole climates or decidual climates. Either there are too much of rain or there is or very less rain kind of creating drought kind of situation. So, either it is flooding or is it creating a drought.

So, the both of these are unfavorable and extreme cases. So, those kinds of things are sea level rising, extreme weather events etcetera this, which in turn is putting pressure again on the human society and the ecology and the environment everyone, there is question on the water security. You cannot guarantee there are questions on food security, you cannot guarantee if something happens if a flooding and drought happens there is a direct impact to the food security, overall balance of the ecosystem human health, directly human health we have been discussing it pollution all of those things, too much of pressure, distance.

Human society as an overall, will degrade, a lot of pressure on infrastructure, a lot of pressure on energy security, you cannot guarantee or even if you guarantee what if something happens DRR kind of thing, disaster if it starts. So, all of these are going to get under pressure. And in turn it will again impact the whole city. So, if you see it is a kind of it is shaping this also in turn this is helping also, so, it is working both ways, if you see it is working both ways, here also here also here also here also.

So, cities and climate change impact there is a direct correlation, if we manage cities, well, we can definitely manage these supply pressure also in a very efficient manner. If we are not able to manage it nicely, there will be lot of presser, tremendous pressure and it may collapse also. So, in extreme cases cities might fail.

So, you may have seen in the last few years, extreme short supply of water in the summer seasons, has caused many migrations also people were forced to leave their homes and go to maybe, another another part of the city or maybe in a faraway places where there was supply of water because without water we cannot live, and such a challenging situation actually, arrive

kind of got arised in those places that were caused that many migration kind of thing. So, if you see in a nutshell, this is this demand pressure and if since, you cannot guarantee the supply of these, then there is a problematic situation. So, this is the kind of complex dynamics between city and climate change you can understand.

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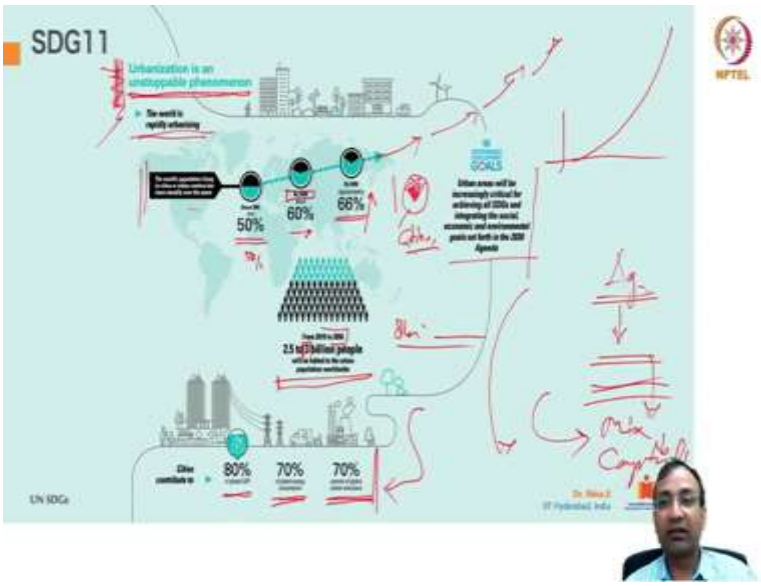

So, if we see the current trend it suggests the urbanization is going to increase at much faster rate with every coming decade. So, in a way we can say as of now, that urbanization is an unstoppable phenomena. The world is rapidly moving towards urbanization from rural Indian economy also if you see in the previous part of decades early decades, after the independence, we used to be more social kind of economy moves based on agrarian, kind of things, but then what are the huge measures, taken for improving the manufacturing sector, product sector, industrial sector, construction, etcetera, etcetera.

Even service sector and now, from mixed use economy to move towards a capitalistic economy. So, that migration is actually slowly happening and happening and that is causing, this fast urbanization, and most of the places most of the countries are having the similar kinds of scenarios, so here, let us see this data, the world's population living in cities or urban centers has rising steadily over the years, 2007 living over 50 percent to 60 percent, it is expected to, reach this figure by 2030. And by 2050, it is estimated that, like, 2/3rd of it is going to be, in the cities. So, from 50 percent, to 2/3rd 66 percent.

And it may rise, again and again, more and more and more, I do not know, what future what lies in the future. So, urban areas will be increasingly critical for achieving all SDG and integrating the social economics and environmental goals set forth in the 2030 agenda. From 2010 to 2050, 2.5 to 3 billion people will be added to the urban population worldwide 3 billion. That is the estimate, currently we are 8 billion So, some numbers cities that contribute to 80 percent of global GDP, only 20 percent comes from the rural areas 70 percent of global energy consumption, 70 percent of global carbon emissions also. So, that is the contribution cities are currently at.

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Let us see, some targets by 2030 ensure access to all adequate safe, and this we have seen, maybe you can go through these in more detail. And they are current indicators are given.

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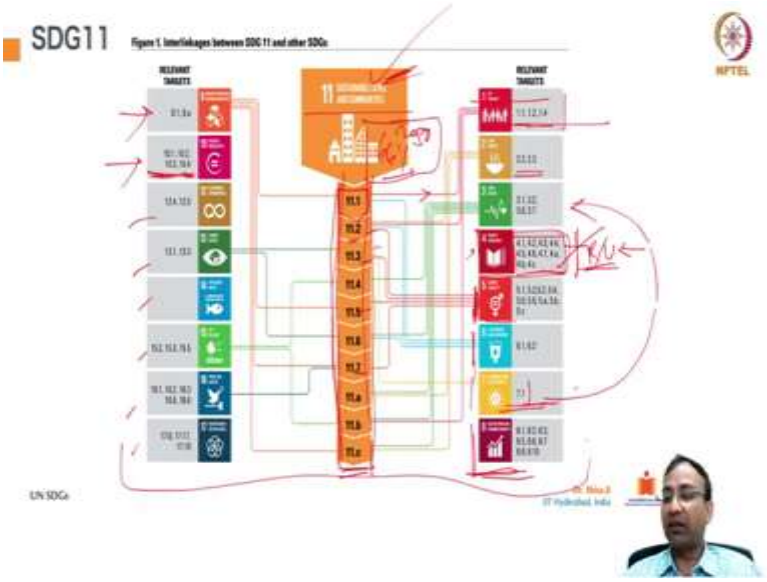

Interlinkages so, since, SDG 11 is a crucial one, the majority of the population right now, also, if you see, in the just few years back 50 percent of population was living in cities, and it is expected is going to rise to 66 percent by 2050. So, that is the 2/3rd of the population. So, definitely, it has direct relation with many other SDGs also, from the first one to second one to the health and well being everyone. So, you see, from target 11.1, we have this connection to no poverty for their targets 1.1 1.2 1.4.

And then to the poverty also 11.2, we have two targets from here. From third, also, you can see, we have, to the clean energy, clean energy, better for good health and well being, quality education, it is coming from 11.2, also 11.3, also 11.5 and 11.7. 2 is coming to the gender equality, and why there is no direct correlation to quality education. But I am surprised to see, maybe these, like, targets, they are not directly, talking about this one, but quality education is, extremely essential, whether it is rural or urban or any such setting.

Because, like, we have discussed in this SDG how it is going to shape a good citizen to the whole country to the whole world, and how a good citizen can be productive citizen also, who is not creating a liability on the society rather it is becoming an asset. And, like, adding all other SDGs to, so, that thing, gender equality, then water related direct, clean energy, decent work and economic growth, well, of course, cities are very much essential part of this.

Nice infrastructure innovation, reduce inequalities, I think some connections, well, if you see if this is not directly related, but the targets, which are linking for quality education through the overall, like, this thing are given over here maybe you can search for these, separately. So, you will find and some connections here also reduce inequalities, consumption CC, live water, below water above land and a peace justice and finally, partnerships. So, in a in a way, if you see, I think, any place of habitation, will definitely, like, will form into part of any and all of these SDGs.

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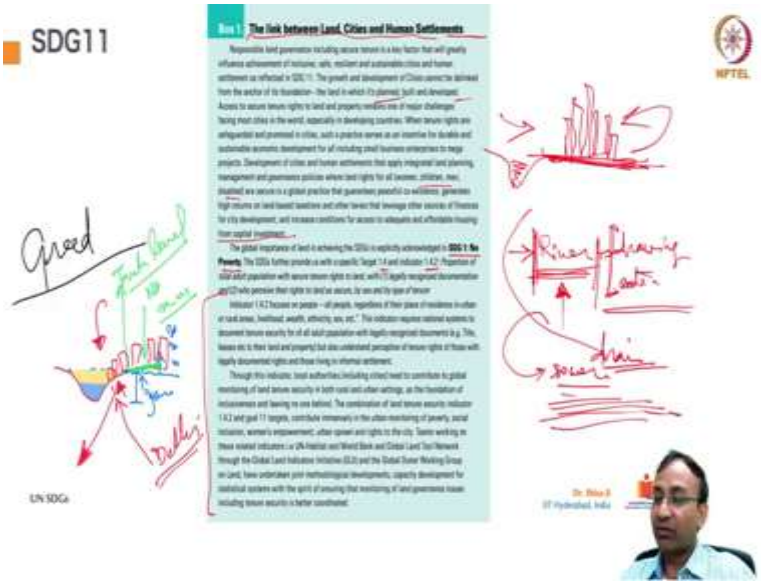

So, that link, so there is definitely a link and that is an unbroken link which carries a direct impact, so responsible land governance, including security here is a key factor that will greatly influence the achievement of inclusive, safe, resilient and sustainable cities and human settlements as reflected in SDG 11. The growth and development of cities cannot be dealing from anchor of its foundation the land in which it is planned, built and developed.

Access to secure tenures to land and property remains one of the major challenges facing most cities in the world especially in developing countries. When tenure rights are safeguarded and promoted in cities. Such a practice serves as an incentive for durable and sustainable economic development for all including small businesses enterprises to mega projects.

Development of cities and human settlements that apply integrated land planning management and governance policies where land rights for all women, children, men, disabled, etcetera are secure is a global practice that guarantees peaceful coexistence generates high returns on land based taxation and other levies that leverage other sources of finances for city development increases conditions for access to adequate and affordable housing for from capital investment.

The global importance of land achieving the SDGs is exclusively acknowledged SDG 1, no poverty, the SDGs further providers with the specific target 1.4 indicator 1.4.2, proportion of land etcetera etcetera. So, you can see in these details how cities, well of course cities are based on the land itself, currently we do not have cities floating in the air, or floating in the water. So, everywhere cities are on land only maybe at the seashore maybe by the bank of river or even in a landlocked position but it is always there on some land. So, there is a direct, correlation, with this land to the city, which is sitting on this land.

You can see this sketch. So, a water body, of course, you are going to consume water from this water body. So, I think you may be aware of situation of, Yamuna River, in the city of Delhi, New Delhi. So, similarly, I think there are a lot of examples, from different places, when one of the major the challenges with these river systems is that, we are drawing water from this, well, drawing water is essential for irrigation, water supply, and meeting our demands, but what happens to the river, what happens to the rights of the river, if you are removing all the water, if you are taking out all the water from the river, the river is simply dead.

So, actually, even it is the human society, which is, creating the stress on the river itself and now, that river, which is deprived of its own water is filled with the sewer. So, now, the river has turned into a drain nothing less than that, that is the situation Yamana, naturally or any other river in across the world, whatever condition they are into today is because of the such mindless exploitation of these resources.

So, there must be some checks and measures to treat these rivers as a rightful owner of their own resources, river is the owner of its resource. So the rivers water should with some level of water must be maintained in the river itself, because otherwise river is going to get simply die. So I think that way.